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MEDITERRANEAN PILOT
VOL. V

COMPRISING
THE COASTS OF LIBYA, EGYPT, ISRAEL,
LEBANON AND SYRIA; THE SOUTHERN COAST
OF TURKEY AND THE ISLAND OF CYPRUS

FOURTH EDITION
1950

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No. 14 **AVAILABILITY AT COMMERCIAL PORTS
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No. 15 **ADMIRALTY PUBLICATIONS.**

Adoption of New Style Compass Rose on Admiralty Charts.

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Addenda and Corrigenda.

Copies of these Notices can be obtained gratis by Masters of ships from Mercantile Marine Offices in the United Kingdom. Copies may also be inspected at Dominion, Indian and Colonial Government Shipping Offices and at British Consulates.

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**NOTATIONS OF SUPPLEMENTS AND ANNUAL
SUMMARIES OF NOTICES TO MARINERS
RELATING TO THIS BOOK.**

To be filled in by Navigating Officer.

(In Chart Depôts the first two columns are alone to be filled up.)

Title.	Date of Publication and Number.	Date of insertion of Note in Margins of Book.

NOTICE.

This volume should not be used without reference to the latest Supplement and Annual Summary of Notices to Mariners affecting it which may have been published.

A Supplement to this volume will generally be published annually until the latter is again taken up for revision.

After the publication of Supplement No. 1, each succeeding supplement cancels the former.

Between the time of the volume being taken up for revision and the publication of the new edition no supplement will be issued, but early in each year a Summary of the Admiralty Notices to Mariners affecting the volume, which have been published during the preceding year, will be issued as a separate publication.

The publication of all Supplements and Summaries of Notices to Mariners is announced in Admiralty Notices to Mariners.

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Gt. Brit. Hydrographic Office.

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FOURTH EDITION, 1950

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1950

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To face page ii.]

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CAUTION.

IN THIS WORK THE BEARINGS ARE REFERRED TO THE TRUE COMPASS, AND WHEN GIVEN IN DEGREES ARE RECKONED CLOCKWISE, FROM 000° (NORTH) TO 359°.

THE BEARINGS OF LIGHTS ARE GIVEN FROM SEAWARD.

THE LATITUDES AND LONGITUDES GIVEN IN THE TEXT ARE APPROXIMATE.

THE DISTANCES ARE EXPRESSED IN SEA-MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO THE TENTH PART OF A SEA-MILE. IT IS OFTEN ACCEPTED AS BEING ONE-TENTH OF A NAUTICAL MILE.

THE DEPTHS ARE GIVEN BELOW CHART DATUM LEVEL WHERE NOT OTHERWISE STATED.

HEIGHTS ON THE LAND ARE GIVEN ABOVE MEAN LEVEL OF HIGH WATER SPRING TIDES.

FIGURES IN BRACKETS GIVEN AFTER THOSE DENOTING FEET, FATHOMS AND YARDS ARE THEIR EQUIVALENTS IN METRES.

TIME IS EXPRESSED IN THE FOUR-FIGURE NOTATION COMMENCING AT MIDNIGHT.

THE TERM "STEAM VESSEL" USED HEREIN INCLUDES ANY VESSEL PROPELLED BY MACHINERY.

A NAME IN BRACKETS, IMMEDIATELY FOLLOWING ANOTHER NAME, IS THE OBSOLETE NAME WHICH IS STILL SHOWN ON THE ADMIRALTY CHARTS. AS A GENERAL RULE, THE BRACKETED NAME IS ONLY INSERTED IN THE DESCRIPTION OF THE PLACE OR OBJECT PREVIOUSLY BEARING THAT NAME.

WHEN SHADING IS USED TO INDICATE COLOURS OF FLAGS, TIDAL LIGHT SIGNALS, OR BEACONS, IT IS AS FOLLOWS:



Yellow.



Red.



Blue.



Green.



Black.

ADVERTISEMENT TO FOURTH EDITION

The Mediterranean Pilot, Vol. V, contains Sailing Directions for the coasts of Libya, Egypt, Israel, Lebanon, Syria, the southern coast of Turkey, and the island of Cyprus.

This, the fourth edition, has been prepared by Captain W. S. Bardwell, D.S.O., M.V.O., R.N., and contains the latest information received in the Hydrographic Department.

The meteorological information has been revised by the Meteorological Office of the Air Ministry. Temperature is expressed in degrees Fahrenheit, rainfall in inches, speed in knots, and distance in sea-miles, unless expressly stated otherwise. Information received from meteorological services, which do not use these units, has been converted into the units mentioned above by the Meteorological Office.

Mariners and others are invited, in the interests of navigation, to forward to the Hydrographer of the Navy, Admiralty, Oxgate Lane, Cricklewood, London, N.W.2, any information that may come under their notice, which would be useful for the correction of charts, and other hydrographic publications issued by the British Admiralty; *early* advice as to newly discovered dangers, the establishment of, or changes in, any aids to navigation is especially requested.

Copies of a form (H.102), on which to render information, can be obtained *gratis* from The Hydrographer of the Navy, Creechbarrow House, Taunton, Somerset, or from any of the Admiralty Chart Agents in Great Britain and abroad, a list of whom is published, annually, in Admiralty Notice to Mariners No. 2.

By the publication of this volume, the third edition of the Mediterranean Pilot, Vol. V, 1937, and Supplement No. 8, 1949, are cancelled, all information affecting that work, contained in Notices to Mariners, up to and including No. 2463 of 1950 has been embodied in this volume. For Temporary and Preliminary Notices to Mariners affecting this edition, the list of Temporary and Preliminary Notices to Mariners in force, published monthly in the weekly edition of the Admiralty Notices to Mariners, should be consulted.

A. DAY.

*Rear-Admiral,
Hydrographer of the Navy.*

*Hydrographic Office,
Admiralty, London,
15th December, 1950.*

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Homs mole head light-structure.
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Sirte light-structure.
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GLOSSARIES OF WORDS OCCURRING IN THE CHARTS AND SAILING DIRECTIONS

ARABIC

ARABIC	ENGLISH	ARABIC	ENGLISH
Abiad, Abyad,		Kibli	South
Abyadh . . .	White	Kothon, Liman .	Port, anchorage
Ahmar	Red (masculine)	Maghreb, Maghrub	West
Ain, 'Ain . . .	Spring	Márabút, Mara-	Monument, tomb,
Aswad	Black	bout, Murābit	saint's tomb
Al	The	Marsa, Mers, Mersa	Bay, cove, har-
Anak, A'naq . .	Cliff		bour, anchorage
Arish, Arisha .	Dune	Masjid	Mosque
Bab	Narrow strait, gate	Matla	East
Bahr	River, lake	Médene, Manāra,	
Baidā, Bādiya .	Desert	Manār	Minaret
Balad	Town, village,	Mina	Harbour
	land	Minqar	Point
Beheira, Bahra,		Mirjan	Coral
Buhireh . . .	Lake	Nahr	River
Biār, Bīr . . .	Wells, well	Natur	Tower
Boghaz, Būghāz	Entrance channel	Nabi, Nebi . . .	Tomb
Bu (Abbrev. Abū):	Father, chief	Rās, Rās . . .	Cape, point, head,
Burj, Burgh, Buy	Castle, fort, tower		promontory
El	The	Sabakat, Sabkha,	Salt lake, salt
Gera	Lake	Sebkha, Tōrga	lagoon, salt
Gharb	West		marsh
Hajar	Stone, rock	Saghira, Seghir,	
Halat	Sandbank which	Saghīr	Small, little
	dries	Sakije	Canal
Hamrā	Red (feminine)	Shab, Sha'b, Shi'b	Rock, reef, rocky
Hassar, Hissar .	Rock		shoal
Jam, Jāmi . . .	Mosque	Shark	East
Jabel, Jebel . .	Mountain, hill,	Sherm, Sharm .	Cove, creek, inlet
	island	Shmal, Shamāl,	
Jezira, Jezirat,		Shimāl	North
Gezira	Island	Sidi, Saiyid . .	Lord, master (title
Jūn	Bay		of descendants
Janub, Junub .	South		of the Prophet
Kabir, Kabira,			and Saints)
Kebir	Large	Tarf, Taraf . . .	Cape
Kalat, Kelat,		Tell, Tall, Tālia .	Hill
Kulat	Castle	Umm	Mother
Kasba	Citadel	Wād, Wadi, Wed,	Valley, river bed,
Kefr, Kafr . . .	Village	Uad	river

TURKISH

TURKISH	ENGLISH	TURKISH	ENGLISH
Ada	Island	Koy	Bight, cove, creek
Adalar	Islands	Köy	Village
Ağız	Mouth	Kule	Tower, spire, peak
Ak	White	Küçük	Small
Alamet	Beacon	Liman, Limanı	Bay, harbour, port
Balçrk	Clay, mud, silt	Lodos	South-west wind
Bati	West, west wind	Mendirek	Mole
Batağı, Batak, Swamp, marsh-		Mercan	Coral
Bataklik, Batak- land, quicksand		Minare	Minaret
liğı		Nehir, Nehri	River
Boğaz	Strait, channel, estuary	Nişan	Beacon
Bucak	Creek	Orman	Forest
Burun, Burnu	Point, cape, head-land, promontory	Ova	Plain
Bük	Creek, bay	Poyraz	North-east
Büyük	Great	Ruzgâr	Wind
Çamur	Mud	Sancak	Flag, district
Çay	River, stream	Sarı	Yellow
Çorak	Marsh (salt)	Sarp	Cliff, steep, rough, rocky, stony
Dağ	Mountain	Saray	Palace, Court
Demiryeri	Anchorage	Set	Mole
Deniz	Sea	Siyah	Black
Dere	Valley, stream	Sıglık	Bank, shoal, shallow
Döküntü	Reef	Su	Water, stream, river
Garp, Garb	West	Samandira	Buoy, float
Göl	Lake	Şark	East
İç	Inner	Şarki	Eastern
İrmak	River	Şehir	City, town
Kaba kum	Gravel	Simal	North
Kale, Kalessi	Castle	Tabya	Battery, earth-work, bastion
Kapi	Gate, pass	Tepe	Hill, tumulus, peak
Kara	Black, land, main-land	Topuk	Bar of a river, sandspit
Kible	South	Vilayet	Province, district
Kilise	Church	Yar	Cliff, precipice
Kırmızı	Red	Yol	Channel, road
Koltuk	Creek		
Köprü	Bridge		
Körfez	Bay, gulf		

Note.—In Turkish, “a” is pronounced as in “far” and never as in “day”; “c” is pronounced as “j”; “â” as “ya”; “e” at the end of a word as “é”; “ı” as in “marine,” but with a dot over it as in “fin”; “ç” as in church and “ş” as in sharp.

ITALIAN

ITALIAN	ENGLISH	ITALIAN	ENGLISH
Baia	Bay	Montagna	Mountain
Banchina	Quay	Monte	Mount
Banco, Banchi	Banks	Nord	North
Calata	Wharf, unloading quay	Nuovo	New
Capo	Cape, headland	Oasi	Oasis
Casa	House	Ridotto	Redoubt
Casino	Country house, club	Rada	Road
Castel, Castello	Castle	Rocca	Rock
Cattedrale	Cathedral	Sabbia	Sand
Collina	Hill	Scogliera	Ridge of rocks awash
Collinette	Small hill	Scoglio	Rock, reef
Fanale	Light	Secca	Reef, sandbank, shoal
Forte	Fort	Sebchet	Salt marsh
Fortino	Small fort	Segnale	Signal, mark
Golfo	Gulf, bay	Sirocco	South-east
Isola	Island	Sud	South
Isolotto	Islet	Torre	Tower
Marina	Beach, landing- place	Uadi	Valley, river bed, river
Molo	Breakwater, mole	Vecchio	Old, ancient

SYSTEM OF ORTHOGRAPHY.

The following rules for the spelling of geographical names (termed the R.G.S. II system) have been adopted for British official use, and the names in Admiralty Hydrographic publications will be rendered in accordance with these rules as opportunity occurs.

In new editions of the various volumes of sailing directions names are, generally speaking, given in accordance with these rules, but where the name on the chart shows an older rendering of a name, such chart name is given in brackets after the new rendering and will also be given in the Index.

The rules for spelling in the R.G.S. II system are as follows :—

- (1) The spelling of every place-name in an independent country or self-governing dominion using the Roman alphabet (including "Roman" alphabets containing extra or modified letters, such as Czech, Serb-Croat, Polish, Romanian, &c.) shall be that adopted by the country or dominion.
- (2) In colonial possessions the spelling of such place-names as belong to languages coming under Rule (1) will be spelt in accordance with that rule.
- (3) The accents and diacritical marks in official use by the above countries will be retained. Wherever it appears desirable, the pronunciation will be shown by giving the name as transliterated on the system below.
- (4) All other place-names throughout the world will be spelled in general accordance with the following system.

The broad features of this system are—

- (a) That vowels are pronounced as in Italian and consonants as in English :
- (b) That every letter is pronounced, and no redundant letters are used.

This system aims at giving a close approximation to the *local* pronunciation ; but it is recognised that in some languages, notably Russian, Greek, and Arabic, the necessity for letter-for-letter transliteration often renders this impossible.

TABLE OF SPELLING AND PRONUNCIATION R.G.S. II.

a	The long and short Italian vowels, as in <i>lāvā</i> ..	Somāli; Rāvennā.*
ā	Between <i>a</i> in <i>fat</i> and <i>e</i> in <i>eh</i> ?; chiefly in Teutonic and Finno-Ugrian languages	Mähring; Pärnu.
ai	The two Italian vowels, frequently diphthongal, almost as in <i>aisle</i> ; but pronounced <i>ei</i> and <i>ē</i> in Greek names	Wadai; Shanghai.
au	The two Italian vowels; frequently diphthongal; almost as <i>ou</i> in <i>out</i>	Sakau; Bauchi.
aw	When followed by a consonant, or when terminal, as in <i>awl</i> , <i>law</i>	Dawna; Saginaw.
b	As in English.	
c	Not to be used, but always replaced by <i>h</i> or <i>s</i> ; except in the compound <i>ch</i> , and in many conventionally-spelt words, as	Kandahar; Serang. Calcutta; Celébes.
ch	As in <i>church</i> ; never <i>tch</i> or <i>tsch</i> for this sound ..	Chad; Kerch.
d†	As in English.	
dh	Soft <i>th</i> as in <i>they</i> ; a slight <i>d</i> sound sometimes preceding it in Semitic languages	Hadhramaut; Riyadh.
ē	Long as in <i>eh</i> ? short as in <i>bet</i> . (For the <i>e</i> sound in the French <i>je</i> , see note at end on the "neutral vowel.")	Gēlo; Mafeking.*
(ee)	Used for <i>i</i> (<i>q.v.</i>) only in a few conventional names	Darjeeling; Keelung.
ei	The two Italian vowels, frequently diphthongal as in <i>rein</i> , but pronounced <i>i</i> in Greek names ..	Beirut; Raheita.
(eu)	Not used as a single sound. As in English; <i>ph</i> must not be used for this sound	Mustafa; Maidan-i-Naftun.
g	Hard, as in <i>get</i> , <i>gift</i> : never as in <i>gem</i> , <i>gin</i> ..	Gedāref; Gilgit.
gh	Soft guttural, the Arabic <i>ghain</i>	Ghadames; Baghdad.
h	Used only when sounded; or in the compounds <i>ch</i> , <i>dh</i> , <i>gh</i> , <i>hh</i> , <i>sh</i> , <i>th</i> , <i>sh</i>	Ahmadabad; 'Abdullah.
i	Long as in <i>marine</i> ; short as in <i>piano</i>	Fiji; Kibonde.
j	As in English; except in transcription of Chinese, where it equals <i>sh</i> , or the French <i>j</i>	Juba, Ujiji (Eng. <i>j</i>); but Jaoping (Fr. <i>j</i>).
k	As in English; hard <i>c</i> should never be used (except in conventionally-spelt words)—thus, not <i>Corea</i> , <i>Cabul</i> , but	Korea; Kabul.
kh	Hard aspirated guttural, as in the Scottish <i>loch</i> (not as in <i>loch</i>)	Khan; Sebkhā.
l† m n†	} As in English.	

*The long and short symbols given here are merely for explanation, not for use.

†See note at end on *Liquid sounds*.

- ng** Has three separate sounds, as in *vanguard*, *finger*, and *singer*. If necessary to distinguish, a hyphen may be placed, as in *van-guard*, *singer*-. . . In-galla; Bongo; Ng-ami; Tong-a.
- ngg** May be used for the sound of *ng* as in *finger* . . . Trengganu; Yanggang-a.
- o** Long as in *both*¶: short as in *rotund* . . . Kigōma; Hōnōlulu.*
- ō** As in German; equals the French *eu* in *pau*; or nearly the English sound in *fur* . . . Barkōl.
- (oo)** Used for *u* (*q.v.*) only in a few conventional names, chiefly Indian and Chinese . . . Poona; Foochow.
- oi** The two Italian vowels; frequently diphthongal as in *oil*, but pronounced like *i* in *fil* in Greek names . . . Hanoi.
- ōi** The diphthong as in French *œil* and Norwegian *høi* . . . Hōiland.
- ou** Dissyllabic, and not as French or English *ou*, except in Greek names where it has the French value . . . Zlatoust; Yaroua.
- ow** Used as a diphthongal combination of *ō* and *w* only in the romanisation of Chinese . . . Hankow.
- p** As in English.
- ph** As in *loophole*; not to be used for the *f*-sound, except conventionally . . . Chemulpho; Haiphong.
- q** Represents *only* the Arabic *qaf* and the Hebrew *qof*; i.e. a guttural *h* (as a rule) . . . Qena; Qiryath.
- qu** Should never be employed to represent the sound of *hw*; thus, not Namaqua, Quorra, but . . . Namakwa; Kworra.
- r** As in English; should be distinctly pronounced.
- s†** As English *ss* in *boss*, not as in *these* or *pleasure* . . . Burgos; Masikesi.
- sch** As in *discharge* . . . Peschanka.
- sh**
t† } As in English.
- th** Hard *th* as in *thick*, not as in *this* (except conventionally in Fijian) . . . 'Athlith; Thingvellir.
- u** Long as in *rude*, or as *oo* in *boot*; short as in *pull* . . . Zūlt; Rūanda.*
- ü** As in German: equals the French *u*, as in *tu* (Fr.) . . . Üsküdar.
- v**
w
x } As in English.
- y** Always a consonant, as in *yard*; it should not be used as a terminal vowel, *e* or *i* being substituted; e.g. not Kwaly or Wady, but . . . Kikuyu; Maya. Kwale; Wadi.
- z** As in *gaze*, not as in *asure*.
- zh** As the *s* in *treasure*, the *z* in *asure*, or the French *j* in *je*; but for the sound in Chinese use *j* (*vide* note about under *j*) . . . Zhob.

*The long and short symbols given here are merely for explanation, not for use.
†See note at end on *Liquid sounds*.

¶The true Italian *ō* is broader than this; almost as in *broth* (= R.G.S. II *aw*).
The letter *o* is conventionally used for this sound in certain names in Nigeria, Tonga, &c.: e.g. Oyo, Fofoa.

NOTES.

The doubling of a vowel or a consonant is only necessary when there is a distinct repetition of the single sound, and should otherwise be avoided

Nuusafee; Moorea;
Jidda; Muhammad.

Accents should not generally be employed; but in order to indicate or emphasise the stress, an acute accent may be used

Sarawak; Qántara;
Tong-atábu; Paraná,

A long or short mark over a vowel (e.g. *ā*, *ō*) should only be used (and that sparingly) when without it there would be danger of mispronunciation ..

Kat; Kyōto; Abōso.

Hyphens will not be used except to indicate pronunciation and with the particle *-i-* (in Persian, Fijian, &c.)

Ta-if; Pusht-i-Kuh;
Nuku-i-Ra.

Inverted comma and apostrophe.—The inverted comma 'is employed only to represent the Arabic *'ain*, the Maltese *'ghain*, and the Hebrew *'ayin*. The apostrophe ' in foreign words indicates a liquid sound (*see* below).

Liquid sounds.—The occasional "liquid" or "palatalised" sound of *d*, *l*, *n*, *s*, *t*, &c. (as in *d'you*, *lure*, *new*, *pursue*, *tune*, &c.) is as a rule sufficiently represented by a following *y*; where, however, owing to a following consonant, or to the palatalised letter coming at the end of a word, the *y* is inapplicable, the liquid sound will be represented by an apostrophe, thus: *d'*, *l'*, *n'*, *s'*, *t'*, &c.

The "Neutral vowel."—The "indeterminate" or "neutral" vowel sound (*er*), i.e. the sound of *a* in *marine*, *e* in *often*, *i* in *stir*, *io* in *nation*, *o* in *connect*, *ou* in *curious*, *u* in *difficult*, &c., *e* in French *je*, or the often unwritten vowel (*Fat-ha*) in Arabic, &c., is represented as a rule by *a*: as in Basra, Hawiya; but sometimes by *e*, when the sound approximates more to *e* than to *a*; as Meshed, El Gezira.

(In any guide to pronunciation issued by the Permanent Committee on Geographical Names, the "neutral vowel" is represented generally by the italic *e*: occasionally also by italic *a* or *u*.)

This sound must not be confused with *e-mute*, where the *e* is not sounded at all: as in Abbeville.

Nasal vowels.—In illustrating the pronunciation of French, Portuguese, Polish, &c., nasal vowels, the nasalisation will be represented by italic *n*; as Cześćochowa pr. Chāⁿstokhóva.

Note.—The Royal Geographical Society has published a book entitled "Alphabets of Foreign Languages transcribed into English according to the R.G.S. II system." This book enables the correct rendering of names to be obtained, also of names in languages which are transliterated letter for letter.

INFORMATION RELATING TO ADMIRALTY CHARTS AND PUBLICATIONS, GENERAL NAVIGATION, AND GENERAL METEOROLOGY.

ON THE CORRECTION OF ADMIRALTY CHARTS.

Guides to Navigation.—In addition to the charts, the navigational publications which are primarily affected by the continual changes and alterations that take place are the Admiralty Sailing Directions, the Admiralty List of Lights, Fog Signals and Visual Time Signals, and the Admiralty List of Radio Signals. The Admiralty Notices to Mariners contain information mainly for the correction of the charts and navigational publications.

CHARTS.

1. Degree of Reliance.—It should be clearly understood that the value of a chart depends on the character of the original survey and on the completeness of the reports of subsequent changes. The remarks on "The Use of Charts as Navigational Aids, &c.", which are subjoined, should be carefully studied in this connection.

2. System of Dating and Issue of Corrected Copies.—Admiralty charts after first publication are kept corrected by means of new editions, large corrections, and small corrections. Copies of charts issued by the Hydrographic Supplies Establishment, Admiralty Chart Agents or Admiralty Chart Depôts are corrected, except from temporary and preliminary Notices to Mariners, for all navigational information to the date of issue.

New Charts.—The date of publication of a chart is shown outside the bottom margin, in the middle, e.g. :—

Published at the Admiralty 30th May, 1947.

New Editions.—When a chart is revised throughout and modernised in style a new edition is published, the date being shown outside the bottom margin and to the right of the date of publication, e.g. :—

New Edition 2nd Jany., 1947.

All large and small corrections notations are at the same time erased, and all old copies of the charts are cancelled.

Large Corrections.—When a chart is corrected from important information which is too comprehensive to promulgate by Admiralty Notice to Mariners or to insert conveniently by hand on existing copies, but when the chart is not revised throughout, the date on which these corrections are made is shown on the chart outside the bottom margin and to the right of the date of publication, and in the case of a chart already marked with a new edition date, below such date, e.g. :—

Large corrections 10th Feb., 1947.

All small corrections notations are at the same time erased, and all copies of the chart are cancelled.

Small Corrections.—

- 5 (i) When a chart is corrected from the information promulgated in an Admiralty Notice to Mariners (except temporary and preliminary Notices), the year, if not already shown, and number of the notice are entered in the bottom left-hand corner of the chart, e.g. :—

Small corrections 1947–903.

10 Copies of the chart stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are corrected by hand from such information.

- 15 (ii) When a chart is corrected from information which is considered of no importance from the standpoint of safe navigation, and which is, therefore, not promulgated in an Admiralty Notice to Mariners, the year, if not already shown, and date of the correction are entered on the chart, in one of two ways, in the bottom left-hand corner below the margin and in sequence with the
20 notations referred to in the preceding paragraph, e.g. :—

*Small corrections, 1947—*5.20*—*

or Small corrections 1947—(VI.25)

25 These indicate that the chart received minor corrections on the 20th May or 25th June, respectively.

In such cases copies of the chart held by ships and establishments are not usually replaced by new copies, but in exceptional cases, e.g., when new compasses are inserted, new copies of the charts may be supplied. It
30 should, however, be particularly noted that the absence of corrections represented by square or bracket dates from a chart does not invalidate it for navigation.

3. Correction of Charts in Ships.—All small but important corrections affecting navigation that can be made to the charts by
35 hand are promulgated in Admiralty Notices to Mariners and, with the exception of corrections from temporary or preliminary Notices, should at once be neatly made in waterproof violet ink on the charts affected, the year (if not already shown) and numbers of the notices being inserted, also in waterproof violet ink, in the bottom
40 left-hand corner of the chart. The recognised abbreviations shown on Admiralty chart No. 5011 ("Signs and abbreviations used on Admiralty Charts") should be used.

Generally speaking, the amount of information which should be inserted on a chart should be in accordance with that already shown.

45 *On large-scale charts*, the abridged descriptions, as shown on chart No. 5011, of all details of all lights, light-buoys and fog signals, and the year dates of obstructions, reported shoals, dredged channels, depth on bars or in shifting channels, and irregularities of lights, should be inserted.

50 *On coastal charts*, the abridged descriptions of only the principal lights and fog signals, i.e., those to assist in approaching or making the land, should be inserted.

Particulars of such lights should be omitted, in the following order, as the scale of the chart decreases, viz. :—

- (i) Elevation, (ii) Period, (iii) Number in Group, and (iv) Visibility.

Particulars of fog signals should be inserted in their appropriate positions if space permits, but should otherwise be entered in a tabulated list under the title or some other convenient place on the chart. 5

Inner harbour light-buoys and beacons should not be inserted on coastal charts, and against other light-buoys only the character of the light should be inserted. 10

On ocean charts, lights which are visible 15 miles or over should alone be inserted and then only their character and colour.

On all charts, writing should be inserted as much as possible clear of the water, unless the relative objects are on the water, and care should be taken not to obliterate any information already on the chart. When cautionary or tidal notes, &c., are inserted, they should be written in a convenient but *conspicuous* place, preferably near the title, where they will not interfere with other details. 15

Erasures should never be made but the details should, when necessary, be crossed through in waterproof violet ink. 20

Admiralty Notices to Mariners are occasionally accompanied by reproductions of portions of charts (known as "blocks"), and when correcting charts from such blocks the following points should be borne in mind :—

- (i) A block may not only indicate the insertion of new information, *but also the omission of matter previously shown*. The latter would, however, invariably be mentioned in the text of the Notice, and the fact that a block accompanies a Notice should not cause the text of the Notice to be disregarded. 25 30
- (ii) The limiting lines of a block are determined for convenience of reproduction and need not be adhered to when cutting out for pasting on the chart, provided that the point mentioned in the preceding paragraph is taken into consideration. 35
- (iii) The new information shown on a block can sometimes be inserted on the chart by hand, the reason for issuing a block in such a case being to avoid a long description of the new information in the text of the Notice. 40
- (iv) Owing to distortion the blocks do not always fit the charts exactly, care should therefore be taken when pasting a block on to a chart that the more important navigational corrections fit as closely as possible. This can best be assured by fitting the block while it is dry and making two or three pencil ticks round the edges for use as fitting marks after the paste is applied. 45

Corrections from Temporary or Preliminary Notices to Mariners should be inserted on the charts *in pencil* and the year and number of the notice should be shown against them, e.g. :—N.M. 625/1947 temp., and also in the bottom left-hand corner of the chart, in pencil, *below* the small corrections notations (*see above*). Temporary corrections should be rubbed out when the notice is received cancelling them, but preliminary corrections should be inked in when the notice is received reporting that the changes have been made. 50

Charts stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents and the Admiralty Chart Depôts are *not* corrected from Temporary or Preliminary Notices to Mariners, and when charts are received from one of these sources they should be
5 corrected in pencil as necessary from the copies of such Notices already held, or from those supplied with the charts.

Corrections from Radio Navigational Warnings concerning derelicts and drifting obstructions, the temporary extinction of lights, displacement of important aids to navigation, ice reports, &c., should
10 also be noted *in pencil*, as received, on the charts affected. Radio Navigational Warnings of a permanent nature and those relating to derelicts and drifting obstructions dangerous to navigation are re-issued in the form of Admiralty Notices to Mariners, but other warnings are not re-issued in this way, except in special circumstances.

15 Corrections from information received from authorities other than the Admiralty should be noted, *in pencil*, on the charts affected, but no charted danger is to be expunged without the authority of the Hydrographer of the Navy.

NAVIGATIONAL PUBLICATIONS.

20 1. **Admiralty Sailing Directions, Supplements, &c.**—The Admiralty Sailing Directions, consisting of about 73 volumes for the whole world, contain general information useful to the navigator.

An index chart bound near the beginning of each volume shows the area dealt with and the serial numbers and limits of all Admiralty
25 charts for the area which were published *when the volume was printed*.

Each volume is periodically revised throughout, and, in the intervals between the publication of new editions, Admiralty Notices to Mariners and Supplements are published to enable the volume to be corrected. It should, however, be clearly understood that Sailing Directions cannot
30 be correct in all minor details after the date of the latest Supplement.

The above-mentioned corrections are not made in the Sailing Directions stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts.

A new edition of each volume of Sailing Directions is published at
35 intervals of approximately from ten to twelve years. The number of the latest Admiralty Notice to Mariners used in its compilation is given in the "Advertisement" on page iii of each volume, and the numbers of the Notices affecting it between the dates of going to press and issue to ships and establishments are given in the Notice
40 announcing its publication, to enable the new edition to be corrected before being brought into use.

A Supplement to each volume is generally published annually, each succeeding Supplement cancelling the former. When a volume is taken up for revision, however, no further Supplement to that edition
45 is issued, but subsequent Notices to Mariners affecting it are summarised each year and issued as a separate publication, until the new edition of the volume is published.

A tabular form for notation of the existence of Supplements and Summaries of Notices is printed on the front fly-leaf of all Sailing
50 Directions, and these notations are made as necessary in all copies issued by the Hydrographic Supplies Establishment and the Admiralty Chart Depôts.

Supplements and Summaries of Admiralty Notices to Mariners should be retained intact. *Whenever reference is made to the Sailing*

Directions, the Supplement and, where applicable, the Summary must be consulted. The existence of a Supplement or Summary of Admiralty Notices to Mariners is to be entered in the tabular form inside the cover of the Sailing Directions. Matter appearing in the Supplements for the first time is indicated by marginal lines or underlining and deletions from the previous Supplement are indicated by brackets. 6

Admiralty Notices to Mariners affecting Sailing Directions *are not* to be cut up and pasted in, but the book is to be annotated in the margin, or corrected in manuscript, as convenient.

2. The Admiralty List of Lights, Fog Signals and Visual Time Signals.—The Admiralty List of Lights, Fog Signals and Visual Time Signals for the world is issued in twelve volumes divided geographically as shown on the index chart at the beginning of each volume. 10

Light-buoys are *not* included in the list. 16

The volumes are published annually at the rate of one volume per month commencing with Volume 1 in January and ending with Volume 12 in December. Supplements to these volumes will not be issued.

Each volume will be issued with an inscription on its cover and title page stating the date to which the volume has been corrected, which will be approximately six weeks prior to the date of its issue. Permanent and temporary corrections or additions to each volume, which may occur between the date of correction and date of issue, will be promulgated by Section III of Admiralty Notices to Mariners. 20

Amendments.—Important amendments are promulgated in Admiralty Notices to Mariners. In Section III of each Weekly Complete Edition of these Notices will be found all additions and alterations made to Lights, Fog Signals and Visual Time Signals by the Notices issued during the week affected; certain other additions and alterations are also included in Section III, which, though not of sufficient importance to necessitate the issue of a Notice to Mariners, will be found of use to the seaman. 25

Corrections to the Light Lists should be made in pencil, or extracted from Section III and pasted in the appropriate volume. 35

Note.—Corrections are not made in copies of the Lists of Lights, &c., stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Dépôts, and copies received from these sources should accordingly be corrected from the weekly editions of the Notices to Mariners before being brought into use. 40

3. The Admiralty List of Radio Signals.—The Admiralty List of Radio Signals is issued in three volumes.

Volume I.—Communications—Comprises particulars of radiotelegraph coast stations, together with general regulations; it also includes such subsidiary services as medical advice supplied by radio, together with details of the organisation for transmitting British official messages to merchant ships. 45

Volume II.—Navigational Aids—Comprises particulars of services from direction-finding stations, radiobeacons, and radio navigational aids (position fixing systems) together with radio time signals and navigational warnings (with ice signals); all relevant codes and regulations will be found in this volume. 50

Volume III.—Meteorological Services—Comprises particulars of weather services provided for the use of shipping, together with relevant codes and lists of meteorological observation stations. 55

New editions of each volume will normally be published annually.

A Supplement to each volume is also issued. These Supplements embody corrections subsequent to the date of going to press and are issued gratis with each volume. All corrections later than those included in the Supplements are promulgated in Section VI of the
5 complete weekly edition of Admiralty Notices to Mariners.

Copies of the List stocked by the Hydrographic Supplies Establishment, Admiralty Chart Agents or the Admiralty Chart Depôts are not kept corrected, and Lists received from these sources should accordingly be corrected from the Supplements and from the weekly editions
10 of the Admiralty Notices to Mariners before being brought into use.

4. The Admiralty Tide Tables.—The Admiralty Tide Tables are published in three sections as follows:—

For "HOME WATERS (British Isles, Europe and north coast of Africa)."

15 For "ATLANTIC AND INDIAN OCEANS."

For "PACIFIC OCEAN AND ADJACENT SEAS."

Each section contains two parts, Part I giving tidal predictions for Standard Ports and tidal stream predictions for certain straits and channels, Part II giving data for predicting tides at places
20 which are not Standard Ports.

Admiralty Tide Tables, Part III, contains instructions for predicting tides and tidal streams, and for analysing observations of tides and tidal streams, with tables to assist prediction and analysis.

25 THE USE OF CHARTS AS NAVIGATIONAL AIDS. AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

(1) **Reliance on a chart.**—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this
30 becomes more important the larger the scale of the chart.

To estimate this the date of the survey, which is always given in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier surveys were mostly made under circum-
35 stances that precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well-frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have
40 been found. The fullness or scantiness of the soundings is another method of estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

It appears to be insufficiently realised that the degree of reliance
45 which may reasonably be placed upon an Admiralty chart, even in surveys of modern date, is mainly dependent on the scale on which the survey was made. The scale for publication is now generally that of the original survey, except in the case of coast sheets which are sometimes reduced. It should not, therefore, be assumed that the
50 original survey was made on a larger scale than that published.

It must be borne in mind that the principal method of ascertaining

the inequality of the bottom of the sea is by the laborious process of sounding, and that in sounding over any area, the boat or vessel obtaining the soundings is kept on given lines; that each time the lead descends, or a sonic sounding is taken, the depth over only a small area is obtained, in the case of the lead, it has a diameter of only a few inches, and that consequently each line of soundings, though miles in length, is only to be considered as representing a narrow width. 6

Surveys are not made on uniform scales, but each survey is made on a scale commensurate with its apparent importance. For instance, a general survey of a coast which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, while surveys of areas where vessels are likely to anchor are made on a scale of three inches to the mile, and surveys of frequented ports or harbours likely to be used by fleets, on a scale of from six inches to ten inches to the nautical mile. 10 15

Close examination by sounding is the only method by which surveys on a large scale can be made, and in view of the vast mileage of surveys yet requiring completion in the interests of navigation, it would be a waste of time to undertake large scale coast surveys. 20

The scale on which a survey is to be conducted having been settled, it is manifestly superfluous to obtain more lines of soundings than can be represented on the paper. 100 soundings, which is the maximum number that can be placed with clearness on every square inch of paper, means that on a scale of one inch to the mile each sounding on the chart occupies an area representing eight acres of actual ground, whilst on a scale of six inches to the mile each sounding represents an area of a little less than a quarter of an acre, i.e., of 100 feet square. 25

The following diagram represents as many soundings as can be placed on a square inch of paper:— 30

16	15	15	13	13	14	12	11	10	9
14	15	14	14	13	13	12	11	9	8
15	15	14	17	16	14	13	10	10	9
16	16	17	18	16	12	11	8	9	10
18	17	15	12	9	7	7	7	9	10
19	16	12	9	5	4	5	6	8	9
22	19	16	10	3	5	6	7	8	10
20	16	12	7	5	6	6	7	8	10
18	15	11	9	7	7	7	8	10	11
20	17	14	11	12	10	9	10	11	13

Little assistance in detecting excrescences on the bottom is afforded by the eye, when sounding in a boat, even in clear water, on account of the observer being within five feet of the surface; none in turbid seas. If, therefore, there is no inequality in the soundings to cause suspicion, a shoal patch between two lines may escape detection. 35

Thus, in a chart on a scale of one inch to the mile, an inequality of some acres in extent rising close to the surface, if it happened to be situated between two lines, might escape detection; whilst in a chart on a scale of 6 inches, inequalities as large as battleships, 40 if lying parallel with, and between the lines of soundings, might exist without detection if they rose abruptly from an otherwise even bottom.

General coast charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the ten-fathom contour line, without taking every precaution 45 to avoid a possible danger; and even with surveys of harbours

on a scale of 6 inches to the mile vessels should avoid, if possible, passing over charted inequalities in the ground, as some isolated rocks are so sharp that the lead may not find the highest part. Better results can, however, be obtained by sonic sounding owing to the rapidity with which such soundings can be taken, but even this method will not find rocks unless the boat or vessel be directly over them.

Blank spaces among soundings mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion.

Soundings in hair line, which are shown on the latest charts in upright figures, and on other charts in sloping figures, indicate that such soundings have been taken from smaller scale charts, an unreliable source, or adapted from old and imperfect surveys.

(2) **Fathom lines a caution.**—Except in plans of harbours that have been surveyed in detail, the six-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shore in such localities without taking special precautions.

The ten-fathom line is, on rocky shores, as before mentioned, another warning, especially for ships of deep draught.

Charts on which no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided as there is no knowing how closely the spot may have been examined.

(3) **Chart on largest scale always to be used.**—It sometimes happens that from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive re-arrangement of coastline or sounding. This is an additional reason, besides the obvious one of the greater detail shown, why this largest scale chart should always be used for navigating.

(4) **Caution in using small-scale charts.**—In approaching land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large-scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile.

For the same reason bearings to near objects should be used in preference to objects farther off, although the latter may be more prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position the longer the line to be drawn.

(5) **Graduation.**—All plans are now being graduated in skeleton style before publication in order to facilitate easy reference to astronomical positions; previously published plans are also graduated as

opportunity offers. The graduation is, however, of necessity often based upon imperfect information of a conflicting nature; for this reason, whenever an astronomical position is quoted other than approximate (i.e., when seconds are given), it is necessary to quote also the number of the particular chart from which the position has been 5 derived.

In this connection it is pointed out that, whenever possible, a position should be transferred from one chart to another by bearing and distance from a distinguishing feature common to both, such as a point of land or a light, &c., and not by the graduation which 10 may differ owing to one of the charts being constructed on later and more complete astronomical data than the other.

(6) **Distortion of printed charts.**—The paper on which charts are printed is, from various causes, subject to distortion, but the effect of this is seldom sufficient to affect navigation. It must not, however, 15 be expected that accurate series of angles taken to different points will always exactly agree when carefully plotted upon the chart, especially if the lines are to objects at some distance. The larger the chart the greater the amount of this distortion.

(7) **Buoys.**—It is manifestly impossible that any reliance can be 20 placed on buoys always maintaining their exact position. Buoys should, therefore, be regarded as warnings and not as infallible navigating marks, especially when in exposed positions; and a ship should always, when possible, be navigated by bearings of fixed objects on shore or angles between them, and not by buoys. 25

(8) **Light-buoys.**—The lights shown by light-buoys cannot be implicitly relied on, as, if *occulting* or *flashing*, the apparatus may get out of order, or the light may be altogether extinguished. These lights in the British isles are from 5 to 217 candle-power.

(9) **Cable-buoys.**—Cable-buoys marking the ends of submarine 30 cables usually are spherical or can shaped, surmounted by a globe and occasionally a flag. Below the topmark two *white fixed* lights, disposed horizontally, may be exhibited, but they cannot be implicitly relied on.

(10) **Lights.**—Arcs drawn on charts round a light are not intended 35 to give information as to the distance at which it can be seen, but solely to indicate, in the case of lights which do not show the same characteristics or colours in all directions, the bearings between which the differences occur.

All the distances given in the Admiralty List of Lights and on the 40 charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet. The table of distances visible due to elevation, at the beginning of each volume of the Admiralty List of Lights, affords a means of ascertaining how much more or less the light is visible should the height of the eye be more or less. The glare of a powerful 45 light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light at night, the fact is often forgotten 50 that from aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be afterwards obtained from the compass.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured 55 by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by remarking its candle-power, as given in the Admiralty List of Lights, and in some cases by noting how much its visibility in clear weather falls short of the range due to the elevation at which it is placed. Thus, a light standing
 5 200 feet above the sea, and only recorded as visible at 10 miles in clear weather, is manifestly of little brilliancy, as its elevation would permit it to be seen over 20 miles, if of any power. (See table in the Admiralty List of Lights.)

The distance from a light cannot be estimated either by its brilliancy
 10 or its dimness.

On first making a light from the bridge, by at once lowering the eye several feet and noting whether the light is made to dip it may be determined whether the vessel is in the circle of visibility corresponding with the usual height of the eye or unexpectedly nearer the light.

15 (11) **Fog signals.**—Sound is conveyed in a very capricious way through the atmosphere. The following points in regard to fog signals should be borne in mind :—

- (a) Fog signals are heard at greatly varying distances.
- 20 (b) Under certain conditions of atmosphere, when an air fog signal is a combination of high and low tones one of the notes may be inaudible.
- (c) There are occasionally areas around a fog signal in which it is wholly inaudible.
- (d) A fog may exist a short distance from a station and not be
 25 observable from it, so that the signal may not be sounded.
- (e) Some fog signals cannot be started at a moment's notice after signs of fog have been observed.

Mariners are therefore warned that fog signals cannot be implicitly relied upon, and that *the practice of sounding should never be neglected.*

30 Particular attention should be given to placing "Look-out men" in positions in which the noises in the ship are least likely to interfere with the hearing of the sound of an air fog signal ; as experience shows that, though such a signal may not be heard from the deck or bridge when the engines are moving, it may be heard when the ship is stopped,
 35 or from a quiet position. It may sometimes be heard from aloft though not on deck.

Great assistance may be obtained from radio beacons at many important lighthouses and light-vessels, but the attention of Mariners is called to the serious dangers which may arise from their misuse.

40 No attempt should be made to approach such a position on a radio bearing, whilst relying only on hearing the sound fog signal in sufficient time to alter course to avoid danger. When the radio fog signal is transmitted from a light-vessel, it is essential in order to avoid collision, that the bearing from the light-vessel should not be kept constant.

45 (12) **Tides.**—In navigating coastal waters where the range of the tide is considerable, caution is always necessary. The tidal predictions for Standard ports in the Admiralty Tide Tables can generally be relied upon to give the times of high and low water to within a few minutes, and heights within a few tenths of a foot. Larger errors are to be
 50 expected in the predictions for places which are not Standard ports, computed from the data in Part II, but such predictions computed from the harmonic constants are always sufficiently accurate for the general requirements of navigation. For Standard ports the heights of the tide at times between high and low water may usually be found
 55 within narrow limits in accordance with the instructions in Parts I and III of the Tide Tables.

The datums of Admiralty charts depending on Admiralty surveys vary with the type of tide, but usually conform with the International agreement, that datum should be "a plane so low that the tide will but seldom fall below it." The datums used by different nations, however, differ very considerably and those of Admiralty charts depending on foreign surveys are always those used by the original surveyors, which vary from "lowest possible low water" to "mean low water" in tidal waters, and are usually mean sea level in non-tidal waters. 5

The datum used is always stated on large-scale Admiralty charts. 10

Caution.—Most datums are above the lowest level to which the tide may fall; the charts therefore do not always show minimum depths.

(13) **Tidal streams.**—Where the tidal streams are semi-diurnal information regarding them is usually given, in a convenient part of the chart, in tabular form or by notes, special symbols being inserted at the positions to which the information refers. In certain cases, where the information available is incomplete, the streams are indicated by means of arrows. 15

There are many places where the tidal streams cannot be predicted by reference to the tide at a Standard port. Although no data for predicting the times at which they flow is given, their general direction is, in many cases, indicated by arrows on the charts. For a few of the straits and channels, where these conditions exist, tidal stream predictions are given in Admiralty Tide Tables. 20

Tidal streams, particularly if rotary, may vary considerably both in direction and rate; predictions of the stream must therefore always be considered approximate. 25

The turn of the tidal stream is not usually coincident with the times of high and low water; in fact, though in estuaries, harbour entrances, &c., the stream usually turns at about the times of high and low water, in open channels, and along open coasts generally, the turn usually occurs more nearly at half tide. Predictions of the times of high and low water must therefore never be used as predictions of the times of slack water. 30

It should be remembered that, even where the general direction of the stream is parallel with the shore, an indraught is usually experienced when crossing the entrances to bays and inlets. 35

(14) **Fixing positions.**—For further information on this subject, see Admiralty Manual of Navigation.

When in sight of land, every opportunity should be taken of fixing the ship's position by terrestrial objects. 40

(a) *Simultaneous bearings or angles.*—The most usual method is by compass bearings of suitable objects, and it must be borne in mind that a fix by only two bearings is liable to error, either an absolute error in taking the bearings, or those made in applying the deviation or in laying the bearings off on the chart. For these reasons, a third or check bearing of some other object should, when possible, be taken, especially when near the shore or dangers. The coincidence of the resulting three lines will prevent any mistakes if the objects are suitably placed. 50

The position may also be fixed by observing horizontal sextant angles of well-defined suitably placed objects. These angles may be plotted on the chart with a station-pointer. Two conditions are, however, necessary to its successful employment; first, that the objects be well chosen; and, second, that the observer is skilful and rapid in his use of the sextant and station-pointer. For the former, 55

reference can be made to the pamphlet on the use of the station-pointer, or to the Admiralty Manual of Navigation; the latter is only to be obtained by practice.

It will readily be seen that a sextant often offers advantages, as angles can be obtained from any position whence the objects are visible, and the fix is in no way dependent on the compass.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in either taking or plotting a bearing under such circumstances may put the ship ashore.

In all cases where great accuracy of position is required, such as the fixing of a rock or shoal, or the addition to a chart of fresh soundings or new buildings, angles should invariably be used. In such cases angles should be taken of a number of objects, five being a good number, since this not only fixes the position beyond doubt, but also affords a useful check on the accuracy of the chart itself. When running a line of soundings it is only necessary to take a third angle every now and then, firstly to make certain that the more important soundings, as at the end of a line, are correctly placed, and secondly to check the general accuracy of the chart.

Sometimes when only one of the selected objects is visible from the compass, a compass bearing of it and a sextant angle to the other may be used to fix the position.

(b) *Simultaneous bearing and distance*.—Attention is also directed to the very useful and handy method of fixing by the bearing and distance of a suitable object.

Should the ship be supplied with ranging equipment, its use here is obvious, but without it a very good approximate distance of an object of known height may be obtained by observing its angle of elevation and obtaining its distance from Lecky's Offshore Distance Tables, which are supplied with all sets of charts. Full directions for the use of these Tables are given with them.

(c) *The running fix*.—If two position lines are obtained at different times the position of the ship may be found by transferring the first position line up to the time of taking the bearing for the second position line. The point of intersection of the second and the transferred position line is the ship's position at the time of the second observation.

The accuracy of this fix will depend on the accuracy of the estimated run (over the ground) between bearings and, therefore, it is essential to take great care that an accurate allowance is made for tidal stream, current, and leeway experienced by the ship during this interval.

The method of fixing by doubling the angle on the bow is useful when passing points of land, &c., in waters where there is either no tidal stream or current, or where this can be estimated with sufficient accuracy.

This method is as follows:—

Suppose that the angle between the ship's head and an object is measured, and found to be X° , and that the time of the observation is noted. Suppose also that the time is again taken when the angle between the ship's head and the object is $2X^\circ$. Then, if the course made good is the course steered, the distance of the ship from the object at the time the second bearing was taken is equal to the run (over the ground) in the interval. Hence the ship's position can at once be laid off as a bearing and distance from the object. In practice the angle X should not be less than about 25° .

The most useful form of this method, the so-called "four-point" bearing, gives a good fix for a departure, but does not ensure safety, as the point and any dangers that may lie off it are abeam before the position is obtained.

The above fix is reliable when there is no tidal stream or current or when it runs directly with or against the course of the ship. When the stream or current runs across the course of the ship or when leeway is to be allowed for, this method should never be used and the ship's position should be obtained by plotting the two bearings as a running fix.

A table "Distance of an object by two bearings" is supplied with certain chart folios, and is also given in Inman's Tables, by which the ship's position at the second bearing can be found: any two bearings at a suitable angle to each other may be used, together with the run between them, but, again, this table should not be used when the vessel is subject to a cross tidal stream or leeway.

(d) *The danger angle.*—The use of the danger angle in passing outlying dangers with land behind them should also not be forgotten.

A vertical danger angle is useful when the danger lies off an object such as a lighthouse, the height of which is known; the angle being obtained from the aforesaid Lecky's Tables. If a horizontal danger angle between two objects is used, however, caution is necessary, as, should the objects not be correctly placed on the chart, the angle taken from it may not serve the purpose. This method should not, therefore, be employed when the survey is old or manifestly imperfect.

(e) *The astronomical position line.*—When fixing by astronomical observations, attention is drawn to the great utility of the position line. Even a single position line may at times give invaluable information, as the ship must be somewhere on this line, provided that the chronometer error is accurately known.

A sounding obtained at the same time may often serve to give an approximate position. Again, by steering along, or at a required distance parallel to, a single position line, a vessel may make her port or avoid a danger, although uncertain of her position.

A very accurate position may be obtained by observations of three or more stars at evening or morning twilight, or by the observation of a bright star at daybreak and another shortly afterwards of the sun when a few degrees (not less than 10°) above the horizon. The position lines obtained from the bodies observed should differ in azimuth by 30° or more.

Mariners are also reminded that, with modern tables for correcting the altitude, observations of the moon entail practically no more calculation than those of a planet. Moon sights are sometimes available when stars are obscured by light cloud, &c.; also, an excellent position may frequently be obtained by simultaneous observations of the sun and moon.

(f) *The radio position line.*—A number of radio systems, of which the principal ones are M/F D/F, Radio Beacons, Consol Beacons, Loran, Gee and Decca, are now in general use from which position lines or fixes may be obtained.

The accuracy and range which may be obtained from these systems vary considerably; their great advantage over other methods lies in the fact that they can be employed under all weather and visibility conditions, though in some cases the results obtained will vary between day and night.

Special receiving equipment is generally required in order to make use of the radio signal, and some systems require special lattice charts or tables for plotting the position lines. Full details of these systems and their coverage areas are contained in Admiralty List of Radio
5 Signals, Volume II.

The mariner should appreciate that with the position-fixing systems the accuracy of a fix will depend on three factors :—

- (i) The distance of the observer from the transmitters.
- (ii) The bearing of the observer from the base line joining the pair
10 of stations which he is using.
- (iii) The angle of intersection of the hyperbolic position lines.

It should be apparent from the inspection of any lattice chart that an inherent small equipment error, or a small personal error that may occur at the receiver, will cause a geographical error of varying amount
15 according to the observer's position.

It is important to realise that accurate equipment is no guard against the vagaries of the propagation of radio waves. The beacons and systems operating on medium and low frequencies are liable to "night error" in areas where the ground and sky waves are received with
20 equal strength; these areas will occur at ranges depending upon the particular frequency used by any beacon or system. Where the transmissions of two stations are synchronised to provide one signal reading and position line, "night error" will be a minimum along the normal to the base line joining the pair of stations, and a maximum
25 towards the limits of their service sector.

Little is yet known about the effects of hills and discontinuities in the terrain (such as cliffs) on the speed of medium- and low-frequency radio waves.

At the other end of the radio spectrum the transmissions of systems
30 operating on the very high frequencies are subject to distortion in abnormal atmospheric conditions.

(g) *Fixing by radar.*—Radar may also be of considerable assistance when navigating in coastal waters in low visibility or at night. It is essential, however, to appreciate the limitations of a radar set when
35 interpreting the information obtained from it. It must be remembered that the radar horizon is only slightly farther than the visual horizon would be, in good visibility, for a height of eye equal to the height of the radar aerial. Hence no echoes will be received from a coastline lying below the radar horizon, while echoes may be received from high
40 ground farther inland which will give a misleading impression of the range of the nearest land.

Depending on the width of its beam, the bearings from a radar set tend to be inaccurate. It is therefore preferable when fixing by radar to use ranges rather than bearings. It is then most important to
45 consider carefully the identity of the object giving the echo, using the bearing as an indication, and the height of the object to determine whether it will appear on the radar presentation. Radar Range Nomograms are useful in deciding this, but a satisfactory result can be obtained by using "Distance to Sea Horizon Tables."

When two or more objects on the radar presentation have been selected and positively identified, a satisfactory fix can be obtained by striking arcs on the chart with the radar range of the selected objects. These arcs intercept at the ship's position. Best results will be obtained by using isolated objects such as detached lighthouses,
50 rocky islets, and the extremities of long piers or jetties, but where no such objects are available a steep coastline with cliffs should be used.

Flat or gently shelving coastlines, such as mud flats or sand dunes, should not be used since it is difficult to identify any portion of them on the radar presentation. Identification is assisted in some areas by fitting objects, such as buoys and beacons, with radar reflectors, causing them to return strong echoes. Attention is drawn to the symbols with which such objects are marked on Admiralty Charts, and which are given in the latest edition of chart No. 5011, "Explanation of signs and abbreviations used on Admiralty Charts."

The difficulty of positive identification of objects is largely reduced if a Chart Comparison Unit is used in conjunction with the navigational radar. Fixes obtained with this equipment employ, in principle, an infinite number of ranges of the terrain in the vicinity of the ship, and in so doing a satisfactory fix will normally be assured.

In addition, radar beacons are available in some areas. Details of these and their use are given in the Admiralty List of Radio Signals, Volume II.

(15) **Observations for errors of the compass.**—No opportunity should be neglected for checking the error of the compass. When coasting, and a well-surveyed and fairly large-scale chart is available, an excellent method of observing the error is by taking the compass bearing of two suitable objects when in transit, and comparing this with the charted bearing; there should be sufficient distance between the objects to provide a sensitive transit. When this method is not available the error should be obtained by azimuths of a heavenly body. Errors should be observed on any change of course on which the ship is steadied for a reasonable time, and at least twice a day when steering a steady course for long periods.

(16) **Change of variation of the compass.**—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales or when the lines are long, the displacement of position from neglect of this change may be of importance. The compasses are re-engraved when the error amounts to a degree, but the chart plates cannot be corrected more frequently from the impossibility of making alterations often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need consideration. For instance, in approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles, and in the English channel about 5° in 400 miles. The Variation chart should be consulted on this head.

On certain general charts embracing large areas with considerable change of variation, true compasses are placed instead of magnetic compasses, the variation being shown by *isogonic lines* (curves of equal magnetic variation), in a similar manner to the Variation chart. One or two *isogonic lines* are also sometimes placed on charts, in addition to the magnetic compasses, in order to indicate the general direction of these curves, and thus facilitate the determination of the variation to be employed in portions of the chart not in immediate proximity to any one of the engraved compasses. Magnetic variation values shown on Admiralty charts are for the 1st July of the year mentioned.

(17) **Local magnetic disturbance of the compass on board ship.**—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in

which it is placed. Observation shows that such disturbance of the compass in a ship afloat is experienced only in a few places on the globe. Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetite ores in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together. Such areas are depicted by a special symbol on charts, and the cause of the magnetic disturbance is referred to as a Local Magnetic Anomaly.

They may also be due to wrecks lying on the bottom in moderate depths, but investigations have proved that, while deflections of unpredictable amount may be expected when very close to such wrecks, it is unlikely that deflections in excess of 7° will be experienced, nor should the disturbance be felt beyond a distance of 250 yards.

It is very desirable that whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

(18) Use of oil for modifying the effect of breaking waves.—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skillfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:—

1. On free waves, i.e., waves in deep water, the effect is greatest.

2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, or in wearing.

6. No experiences are related of its use when hoisting a boat up in a sea-way at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

At anchor, when the sea is sufficient to render it difficult to hoist up or in boats, oil bags from forward or from the swinging booms have been found to render the sea alongside comparatively smooth.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances. Running before the wind they should be hung on either bow and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the depth of the water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

12. Towing a vessel in a heavy sea, oil is of the greatest service and may prevent parting the hawser. Distribute from the towing vessel forward and on both sides; if used only aft the tow alone gets the benefit.

(19) **Mirage and abnormal refraction.**—An unusual lapse rate of temperature (and therefore density as well) with height immediately above the sea (or land) surface produces a distortion in the appearance of objects near the horizon; such a phenomenon is known as mirage.

When the surface is relatively cold (and the wind very light) so that the density of the air decreases rapidly for a short distance above the surface, light rays from objects low down near the horizon are bent down, the same way in fact as are usually the rays of the sun when entering the earth's atmosphere at a low altitude. The effect is to render visible objects that are normally below the horizon, e.g., lights may be "raised" at night at much greater distances than one would ordinarily expect. This phenomenon is known as "looming."

A further occasional effect produced when the air is appreciably warmer than the sea is "superior mirage," in which an inverted image is seen over the real object; sometimes an erect image is seen immediately above and touching the inverted one. The object and its images in this instance are well defined in contrast to the shimmering object and image of the inferior mirage. Superior mirage is most often experienced in high latitudes and wherever the sea surface temperature is abnormally low.

"Inferior mirage," the effect of which is to decrease the distance at which objects are visible in a horizontal direction, is due to a rapid increase of density with height close to the surface such as occurs when air of comparatively low temperature blows over a warmer sea, or over a tarred road or desert when a hot sun is beating down on it. In either event light rays are bent up when approaching the surface where the density of the air is much less than above. The coastline and at times a ship or island, may appear to be floating in air above

a shimmering horizon, possibly with, in the former instance, her hull either invisible or with an inverted image underneath. Inferior mirage is comparatively uncommon at sea and is more likely to be observed along a coastline than well out to sea.

- 5 When mirage is evident caution must be used in taking sights with a sextant, for abnormal refraction must necessarily be present also. With inferior mirage better, but not normal, results will usually be obtained by ascending as high as possible in the ship; with superior mirage the height of eye should be as low as possible. It is, however, 10 advisable, whenever abnormal refraction is suspected, to measure the elevation of the celestial body above the back as well as the front horizon as explained in navigational text-books.

- (20) **Aurora** —The most common form of aurora is an arc system, single or multiple, narrow and well defined, or broad and diffuse, and 15 centred on the magnetic meridian.

- The most usual colour is pale whitish green when the auroral activity is weak and diffuse: but when the aurora arises high towards the zenith in the form of rays, rayed curtains and draperies with much rapid movement of the constituent rays, the colours sometimes become 20 much stronger and more vivid, and include bright green, red and violet. When the curtains forming the aurora converge to form a corona, which may rotate very rapidly about the point of convergence, the displays may become very complex, filling practically the whole sky, and extending far to the equatorial side of the zenith with much rapid 25 movement and change of colour from instant to instant.

- Though the most usual duration of auroral displays in these high latitudes is several hours, they not infrequently last throughout the whole night from dusk to dawn. In such long displays the really intense and violently active periods with vivid strong colours are 30 generally confined to spasms of 15–30 minutes, with the intervening periods filled with diffuse glows or quiet arc systems.

- The absolute intensity of the light of the aurora is seldom great, and the brighter stars usually glimmer through it. In the most vivid and intense displays, the light may equal, but rarely surpasses, that 35 of the full moon in a cloudless sky. It may give enough light to read by. On such occasions the aurora may be visible to some extent in partial twilight.

- Though in high latitudes aurora occurs any time in the dark hours it is probably most frequent in the late evening hours from 9 p.m. till 40 midnight or just after; it is more frequent in the equinoctial months than at other times and has a well-defined 11-year period of activity following the cycle of solar activity. A maximum of activity occurred in 1948, and the interval from maximum to minimum activity usually occupies a period of about 6 to 7 years. In high latitudes this cycle 45 of activity is reflected more in the intensity and vividness of the displays than in their frequency of occurrence. Though really outstanding displays tend to occur around the years of maximum activity they may occur at any time of the cycle, except perhaps near the absolute minimum.

- 50 In addition to this 11-year cycle of activity active periods tend to recur at intervals of 27 days, *see* Magnetic Storms.

- Northern hemisphere.*—Aurora Borealis occurs most frequently along a zone which forms an approximate oval, of average radius 23°, with centre in the extreme north-west of Greenland. This zone of maxi- 55 mum frequency crosses Hudson Bay and the Labrador coast in about lat. 58° N. It runs south of Cape Farewell and along the south coast of

Iceland. It lies just north of North Cape, touches the extreme north of Novaya Zemlya, skirts Cape Chelyuskin and then eastward just north of Wrangel island into the north of Alaska. Along this zone aurora of some kind can probably be seen every suitable night when the sky is clear; 250 miles outside this maximum zone to the southward the auroral frequency decreases sharply to about 70–100 nights a year on the average, and to 20–25 nights 500 miles south of the maximum zone. Inside the maximum zone the geographical distribution of frequency is not so well established but it probably falls off more gradually than it does outside.

On the zone of maximum frequency itself aurora appears as frequently to the south of the zenith as to the north, but with increasing distance outside the zone the appearances concentrate more into the northern sky; the reverse is true inside the zone.

Southern hemisphere.—The frequency and distribution of Aurora Australis is not fully known. It is probable that it is more frequently seen at sea between about long. 50° E. and 175° W. than in other longitudes. Very fine displays have occasionally been seen in Australasia and on passages across the Southern Ocean. There is nevertheless a general impression that aurora is less frequent in the southern than in the northern hemisphere. This is probably to be accounted for by the fact that, apart from whaling and exploring expeditions, ships' tracks in general do not extend to such high latitudes as in the northern hemisphere.

The zone of maximum auroral frequency is roughly annular and is near the circumference of a circle of radius about 1,080 miles, centred in about lat. 75° S., long. 129° E. The frequency falls off both outside and inside this zone. A large part of the zone is within the continent of Antarctica.

(21) **Magnetic storms.**—Magnetic storms vary in intensity and frequency with the sunspot cycle, similarly to aurorae. An intense magnetic storm is always accompanied by a bright and active aurora. The deeply coloured aurorae, showing more pronounced red and green, and sometimes also blue and violet, tints, are invariably connected with magnetic storms of considerable or great intensity. Such a storm will produce simultaneous aurora in both hemispheres. In the greatest storms aurorae in some form may be visible down to about 20° north latitude in certain parts of the oceans, especially between the meridians of 30° W. and 140° W. Magnetic storms vary greatly in duration from a few minutes to several days; they are generally more intense during the hours of darkness. Long-continued storms usually show great fluctuations with periods of complete or partial quiescence. Similarly the associated aurora fluctuates between active and quiescent forms.

The origin of magnetic storms and aurorae is not yet fully understood, but they are intimately connected with the state of a local area of the sun. As the same part of the sun is again presented to the earth after an interval of about 27 days, a magnetic storm and aurora may recur at this time, usually in less intense form.

A ship's compass may tend to deviate during the progress of a considerable magnetic storm. In more intense storms the compass needle may oscillate 1° or more either side of its normal position. Such oscillation may persist for as long as 10 or 20 minutes before dying out. Further oscillation may occur after a period of quiescence. Deviations of 2° or more are rare, but during the great magnetic storm and aurora of January 25th, 1938, one of 4° to the eastward

was observed off the Portuguese coast. During a severe magnetic storm the compass may be deflected continually in one direction to the extent of about half a degree for some hours. When bright aurora is seen, especially if it is of the more deeply coloured and rapidly moving kind, and particularly when it is observed in low latitudes, the possibility of deflections of the compass should always be borne in mind.

During a considerable magnetic storm freak wireless reception may occur on certain waves and short-wave transmission may fade to complete silence. Beam radio communication, especially in a west-east or east-west direction, may be interrupted. Such conditions may last in some degree over a period of several days, at times when the sun is unusually active. Short-wave fading also occurs occasionally from a different form of solar disturbance known as a "bright eruption," when this is very intense. On the average such fading begins about 7 minutes after occurrence of the bright eruption and may last 5 or 10 minutes, gradually returning to normal within a period of 40 to 45 minutes. These fadings are confined to the daylight hemisphere of the earth, while the magnetic storm fadings may occur by day or by night.

GENERAL METEOROLOGY.

(All the following articles do not apply to every Pilot, but articles applicable to this Pilot will be referred to in the Climate and Weather Section in Chapter I.)

(1) **Lows.**—A low, or depression, appears on a synoptic chart as a series of isobars roughly circular or oval in shape, surrounding an area of low pressure. It is a main feature of the weather at sea in middle latitudes where it is responsible for most of the occasions of strong winds and unsettled weather, though not all depressions are accompanied by strong winds.

Lows vary very much in size and depth; one may be only a hundred miles in diameter and another over two thousand miles; some are deeper than others, a deep low being one in which the pressure is very much lower near the centre than on the outside whereas, on the other hand, a shallow depression is one where the pressure, although low near the centre, is not very much lower than in the surrounding districts.

Note.—The bracketed equivalents hereunder refer to the Southern Hemisphere.

In the northern (southern) hemisphere the winds blow round an area of low pressure in an anti-clockwise (clockwise) direction; there is also a slight inclination across the isobars towards the lower pressure. Thus the well-known rule for the northern (southern) hemisphere is that when an observer faces the wind the direction of the lowest pressure is from 8 to 12 points to his right (left). The strength of the wind is in all instances closely related to the steepness of the barometric gradient or distance apart of the isobars; the closer the isobars the stronger the wind.

Lows may move in almost any direction, though most often towards north-east (south-east) or east, at a speed of anything between 10 and 40 knots, though occasionally as much as 60, during the middle and most active stage of their existence; they slow down when filling up (see "occlusion" below). The life of a low is in the region of 4 to 6 days.

There are usually one or more fronts, probably radiating from the centre, in the area covered by a low ; each front on a synoptic chart represents a belt of relatively bad weather, accompanied by a veer (backing) of wind, which marks the change from the weather characteristic of one air mass to that of another. During the first two or three days of its life a low has a warm and a cold front, the area between the two being known as a warm sector because the air has come from a warmer locality than that which is outside the sector (see Fig. 1a). Warm air is lighter than cold air and it rises over the cold air ahead of the warm front as shown in Fig. 1b ; this causes condensation of the water vapour in the warm air, forming at first cloud and later drizzle or continuous steady rain. The cloud spreads out ahead of the warm front, and the highest cloud, cirrus or mares' tails, is often about 500 miles ahead. At the rear boundary of the warm sector, known as the " cold front," the cold air is pushing under the warm air forcing the latter to ascend rapidly ; this process is sometimes violent enough to produce squalls. The rapid ascent of the warm air causes the moisture to condense in the form of cumulo-nimbus clouds (shower clouds), from which heavy showers may fall. The cold front gradually overtakes the warm front so that the warm sector is eventually lifted up from the earth's surface. When this has occurred the low is said to be occluded, and the warm and cold fronts have merged into the third type of front known as an " occlusion " (see Figs. 2a and b). When a low has become occluded, it usually decreases in intensity and rate of travel, and gradually fills up. On the other hand, a low which has a marked warm sector is likely to be deepening, the winds associated with it may increase in force and its rate of travel may increase. Lows are usually travelling in a direction approximately parallel to the isobars (and in the direction of the wind) in the warm sector.

The approach of a low is indicated by a falling barometer. In the northern (southern) hemisphere, if the low is approaching from westward and passing northward (southward) of the ship, clouds appear on the western horizon, the wind shifts to a south-westerly (north-westerly) or southerly (northerly) direction and freshens, the cloud layer gradually lowers, and finally drizzle, rain or snow begins. If the low is not occluded, after a period of continuous rain or snow there is a veer (backing) of wind at the warm front, a rise of temperature and diminution or cessation of rain (or snow) in the warm sector, the visibility being usually moderate and the sky overcast with low cloud. The passage of the cold front is marked by the approach from westward of a thick bank of cloud (which however cannot often be seen because of the customary low overcast sky in the warm sector), a further veer (backing) of wind to west or north-west (south-west), sometimes with a sudden squall, rising pressure, a fall of temperature, squally showers of rain, hail or snow, and improved visibility (except during showers). The squally showery weather with a further veer (backing) of wind and drop in temperature may recur while the low recedes owing to the passage of another cold front or occlusion. If the low is occluded, the occlusion is preceded by the cloud of the warm front ; there may be a period of continuous rain mainly in front of and at the line of occlusion, or a shorter period of heavy rain mainly behind the occlusion, according as the air in front of the occlusion is colder or warmer than that behind it. There may be a sudden veer (backing) of wind at the occlusion.

Often another low follows 12 to 24 hours later, in which event the

barometer begins to fall again and the wind backs towards south-west (north-west), or even south (north).

If a low travelling eastward or north-eastward (south-eastward) is passing southward (northward) of the ship, the winds in front of it are easterly and they back (veer) through north-east (south-east) to north (south) or north-west (south-west); changes of direction are not likely to be so sudden as on the southern (northern) side of the low. In the rain area there is often a long period of continuous rain and unpleasant thick weather with low cloud. In winter in the colder regions the weather is cold and raw and precipitation is often in the form of snow.

Near the region of lowest pressure, lulls are sometimes experienced, but sudden changes are likely, and in a deep low the wind may increase in strength very rapidly, perhaps to gale force as the barometer begins to rise.

Sometimes in the air circulation of a large low, usually on the equatorial side and often on a cold front, a secondary depression develops, travelling in the same direction as the primary but usually more rapidly. The secondary often deepens while the original low decreases in intensity. In the region between the primary and the secondary depressions, the winds are not as a rule strong; but on the farther side of the secondary, usually the southern (northern) side, winds are likely to be strong and they may reach gale force. Thus the development of a secondary may cause gales at a greater distance from the primary than anticipated, while there may be only light winds where gales were expected.

The above is a brief general description of lows and the associated weather in temperate or middle latitudes of the northern (southern) hemisphere. It must be emphasised, however, that individual lows in different localities differ considerably from one another, according to the characteristics (especially the temperature and humidity) of the air currents of which they are composed, and the nature of the surface over which they are travelling.

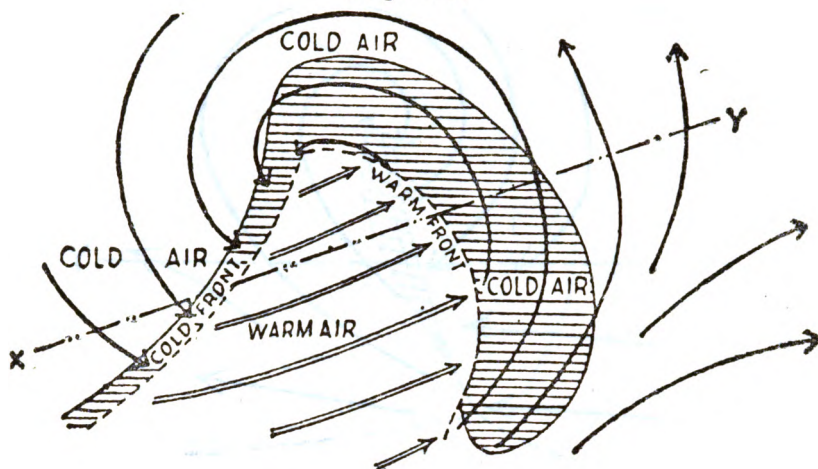
(2) Tropical revolving storms.—*Practical rules for avoiding them.*—These storms are so named because the wind blows round an area of low pressure situated at the centre. The direction of rotation is anti-clockwise in the northern hemisphere and clockwise in the southern hemisphere. The wind does not revolve round the centre of the low pressure in concentric circles but has a spiral movement inwards, towards the centre.

A tropical storm is not so extensive as the depression of higher latitudes but, within 75 miles or so of the centre, the wind is often far more violent, and the high and confused seas near the centre may cause considerable damage to large and well-found ships, while small vessels (for example, destroyers) have foundered. The danger is still greater when ships are caught in restricted waters without adequate room to manoeuvre. Due to torrential rain and sheets of almost continuous spray, visibility near the storm centre (but outside the "eye") is almost nothing. Within 5 to 10 miles of the centre the wind is light or moderate and variable, the sky is clear or partially so, and there is a heavy, sometimes mountainous, confused swell; this area is known as the "eye" of the storm.

Every ship navigating in an area subject to tropical storms, during the period of their occurrence, should be constantly on the alert for any sign of their approach, so that steps can be taken to avoid the danger zone while there is still time and sea-room.

NORTHERN HEMISPHERE.

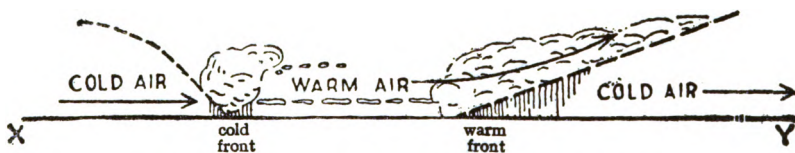
Fig. 1a.



Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.
 The shading shows the areas where rain (or snow) is most probable.
 Width of rain belt ahead of warm front is generally between 100 and 200 miles.

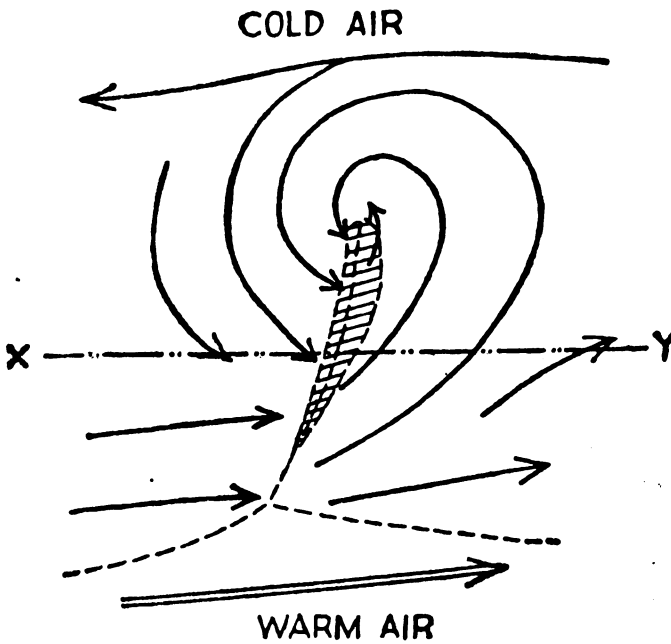
Fig. 1b.



Vertical section of the depression along the line XY.

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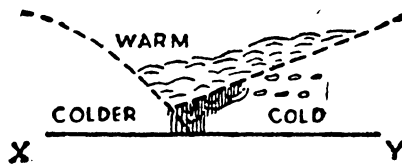
Fig. 2a.



Plan of an occluded depression.

The shading shows the region where rain (or snow) may be expected near the occlusion.

Fig. 2b.

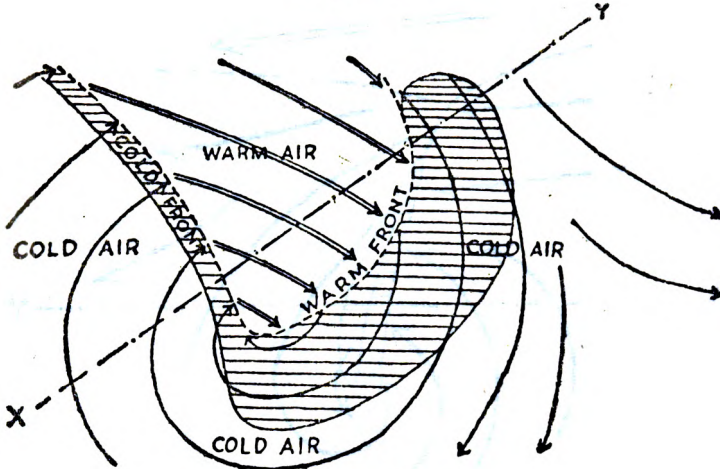


Vertical section of an occlusion of the cold front type.

The air in front of the occlusion is warmer than the air behind it.

SOUTHERN HEMISPHERE.

Fig. 1a.



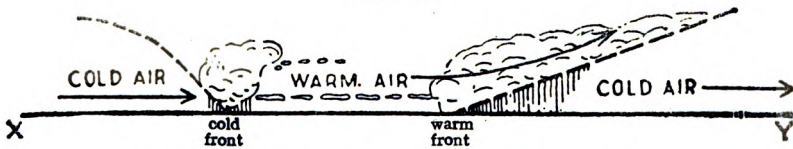
Plan of a developed depression.

The double lines show the flow of the warm air, and the single lines the flow of the cold air.

The shading shows the area where rain (or snow) is most probable.

Width of rain belt ahead of warm front is generally between 100 and 200 miles.

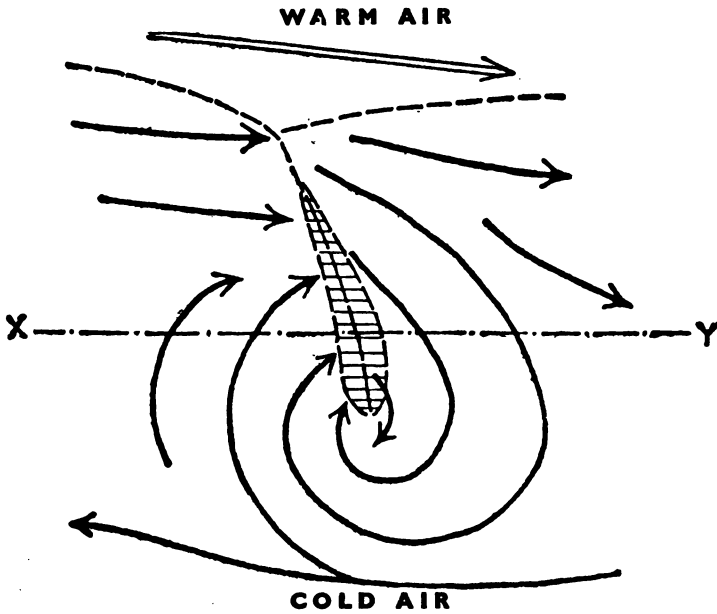
Fig. 1b.



Vertical section of the depression along the line XY.

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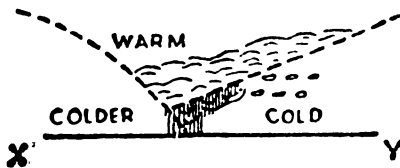
Fig. 2a.



Plan of an occluded depression.

The shading shows where rain (or snow) may be expected near the occlusion.

Fig. 2b.



Vertical section of an occlusion of the cold front type.

The air in front of the occlusion is warmer than the air behind it.

Localities, season, and average frequency.—Tropical storms occur for the most part on the western side of the oceans, though they are also experienced in the Bay of Bengal, off the north-west coast of Australia, and off the west coast of Central America. They are unknown in the South Atlantic. They are given various names according to the part of the World in which they occur. 5

Western North Atlantic	}	hurricanes	10
Eastern North Pacific			
South Pacific			
Western North Pacific	}	—typhoons	
Indian Ocean			
Bay of Bengal	}	cyclones	
Arabian Sea			
North-west Australia	}	—willy-willies	

They are most frequent during the late summer and early autumn 15 of their hemisphere; they are comparatively rare in the southern hemisphere from mid-May to November, and in the northern hemisphere from mid-November to mid-June. In the Arabian Sea, however, storms are most likely to occur at the change of the monsoon, i.e. October–November, and May–June, though they average only one 20 or two a year. Out-of-season storms occur from time to time, particularly in the western North Pacific, where no month is entirely safe, and in the Indian Ocean, where one is reported south of the Equator perhaps once in two years outside the usual season. The following table shows approximately the average number of severe tropical 25 storms recorded in 10 years in the several areas:

West Indies	50	30
Western North Pacific	.	.	.	.	.	250
„ South Pacific	.	.	.	.	.	30
Southern Indian Ocean	.	.	.	.	.	60
Bay of Bengal	.	.	.	.	.	20
Arabian Sea	.	.	.	.	.	10
Eastern North Pacific	.	.	.	.	.	30
West Coast of Australia	.	.	.	.	.	10

Variations in any one year amounting to 50% above or below the 35 average are not unusual. Some of the figures quoted may be an underestimate since in the less-frequented parts of the world some storms may have escaped detection.

Origin, movement and extent.—Tropical storms originate as a general rule in the doldrums, between the parallels of 7° and 15° of latitude; 40 those which affect the western part of the Pacific, South Indian and North Atlantic Oceans are first reported in the western third of those oceans, though there are exceptions such as in the North Atlantic during August and September where an occasional storm is known to begin near the Cape Verde islands. In the northern hemisphere 45 they move off in a direction between 275° and 350°, though most often within 30° of due west. When in a latitude of 25° or so they usually recurve away from the equator and, by the time they have reached the 30th parallel, the track (or path as it is more usually called) is north-easterly. In the southern hemisphere they move off in a WSW. 50 to SSW. direction (usually the former), recurve at about 15° to 20° S., and thereafter adopt a south-easterly path. Many storms, however, do not recurve but continue in a west-north-westerly (or west-south-westerly) direction until they reach the mainland, where they quickly die. 55

The speed of these storms is usually about 10 knots in their early stages, increasing a little with latitude; it seldom exceeds 15 knots before recurving, but thereafter 20 to 25 is usual, though speeds of 40 knots or even more have been known.

- 6 Occasionally storms move erratically, the path turning towards the equator, or adopting an easterly component in a low latitude, or even making a complete loop, but on these occasions its speed is low, usually less than 10 knots, while the unusual path is being followed.

The extent of the storm area varies considerably with individual storms, but generally speaking, winds of force 7 or more are improbable at more than 200 miles (especially on the equatorial side of the storm area), and force 8 unlikely to be exceeded at more than 100 miles, from the storm centre, at a latitude of less than 20°. Thereafter the radius increases with latitude so that these distances are nearly doubled on reaching the 35th parallel, but the intensity diminishes near the centre. Hurricane force winds are likely within 75 miles of the storm centre in the tropics, and gusts exceeding 150 knots have been reported in a few instances within 50 miles or so (except in the eye of the storm).

- 20 *Warning of existence or approach.*—In most instances, warning of the position, intensity and probable movement of a storm is given by radio at frequent intervals. (See Admiralty List of Radio Signals, Volume III.) Sometimes, however, there is insufficient evidence available for an accurate warning, or even a general warning, to be given, and ships must then be guided by their own observations. Of the following indications of the proximity of a tropical storm, the first is by far the most reliable within 20° or so of the equator; it should be borne in mind, however, that very little warning of the approach of an intense storm of unusually small diameter may be expected.

- (a) If the corrected barometer reading is 3 mb. or more below the mean for the time of year, as shown in a climatic atlas or on the appropriate chartlets in the meteorological text of this Pilot, suspicion should be aroused and action taken to meet any development, such as raising steam in any available additional boilers, &c. It should be noted, however, that the barometer reading must be corrected not only for height, latitude, temperature and index error (if mercurial), but also for diurnal variation, the amount of which is given for each hour of the day in the Air Ministry climatic atlases and in the meteorological text of this Pilot. If the reading thus corrected is 5 mb. or more below normal, it is time to take avoiding action for there can be little doubt that a tropical storm is in the vicinity. According to an analysis of observations in the Western Pacific the centre of the storm is probably not more than 200 miles away. At this distance, at any rate in the China Sea vicinity, the wind has usually increased to about force 6.

When proceeding through an area liable to be visited by these storms it is desirable to take hourly readings of the barometer.

- (b) An appreciable change in the direction and/or strength of the wind.

(c) A swell is sometimes evident, proceeding from a direction that approximates to the bearing of the centre. If ahead of the storm this indication may be apparent before the barometer begins to fall.

- (d) Extensive cirrus cloud followed, as the storm becomes closer, by much alto-stratus cloud and subsequently fracto-cumulus or "scud."

(e) In addition there is the warning that can be given by Radar. Certain sets can display on the screen areas where moderate and heavy rain is falling. The greatest range to which this can be done at present is about 80 miles. Although moderate or heavy rain does not fall symmetrically all round a storm, it is continuous for at least 50 miles in a broad sector extending from the "eye" of the storm where there is a circular area of relatively light winds and clear or partially clear sky. By the time this final, and quite unmistakable, evidence of the exact position of the storm is available, the ship is already in fairly high seas, and is probably experiencing winds of force 9 or 10. It should be in time, however, to enable her to avoid the centre, on the edge of which conditions are worst of all.

Note.—In accordance with Article 35 of the International Convention for Safety of Life at sea it is the duty of every ship who suspects the presence or formation of a tropical revolving storm immediately to inform other vessels and shore authorities with all the means at her disposal. Weather reports should be made by radio at frequent intervals giving as much information as possible, especially corrected (not for diurnal variation as in (a) above) barometer readings. If barometer readings are uncorrected this fact should be stated in the signal.

Information required by the seaman before deciding upon action to be taken.—To decide on the best course of action if a storm is suspected to be in the vicinity, a seaman requires to know:—

- (a) the bearing of the centre of the storm ;
- (b) the path of the storm ;
- (c) the semicircle in which the ship is situated.

If an observer faces the wind, the centre of the storm will be from 9 to 11 points on his right-hand side in the northern hemisphere when the storm is about 200 miles away, i.e., when the barometer has fallen about 5 millibars and the wind has increased to force 6 or thereabouts ; as a rule the nearer one is to the centre the more nearly does the angular displacement approach 8 points.

The path of the storm may be approximately determined by taking two such bearings with an interval of from two to three hours between observations, provided that allowance is made for the ship's movement. It can, however, be assumed that the storm is not travelling towards the equator ; and, if in a lower latitude than 20°, its path is most unlikely to have an easterly component ; and, on the rare occasions when neither of these statements applies, the storm is moving very slowly. (Exceptions to this are most likely in the South Pacific, where the occasional storms often move off on a course almost due south which develops an easterly component at a latitude of about 15°, and in the western North Pacific in the instance of some of the out-of-season storms which may recurve at an early stage.)

The diagram headed "Typical Paths of Tropical Storms" (at the end of this article) illustrates the terms "dangerous semicircle" and "navigable semicircle." The former lies on the side of the path towards the usual direction of recurvature, i.e., the right-hand semicircle in the northern and the left-hand semicircle in the southern hemisphere. It is so called because a sailing or low-powered ship caught in it may be blown towards the path along which the storm will pass, or the storm may recurve and the centre pass over her. The navigable semicircle is that which lies on the other side of the path. A ship situated within this semicircle will tend to be blown away from

the storm centre, and the recurvature of the storm will increase her distance from the centre.

Practical rules for avoiding tropical storms.—In whatever situation a ship may find herself, the matter of vital importance is to avoid
 5 passing within 50 miles or so of the centre of the storm ; it is preferable to keep outside a radius of 200 miles or more, because at this distance the wind does not often exceed force 7 (and is generally not more than force 6), and freedom to manœuvre is maintained. If a ship has at
 10 least 20 knots at her disposal, and shapes a course that will take her most rapidly away from the storm before the wind has increased above the point at which her movement becomes restricted, it is seldom that she will come to any harm.

Sometimes a tropical storm moves so slowly that a vessel, if ahead of it, can easily outpace it or, if astern of it, can overtake it. Since,
 15 however, she is unlikely to feel seriously the effects of a storm so long as the barometer does not fall more than 5 mb. (corrected for diurnal variation) below the normal, it is recommended that frequent readings should be made if the presence of a storm in the vicinity is suspected or known, and that the vessel should continue on her course until the
 20 barometer has fallen 5 mb., or the wind has increased to force 6 when the barometer has fallen at least 3 mb. If and when either of these events occurs, she should act as recommended in the following paragraphs, until the barometer has risen above the limit just given, and the wind has decreased below force 6. Should it be certain, however,
 25 that the vessel is behind the storm, or in the navigable semicircle, it will evidently be sufficient to alter course away from the centre.

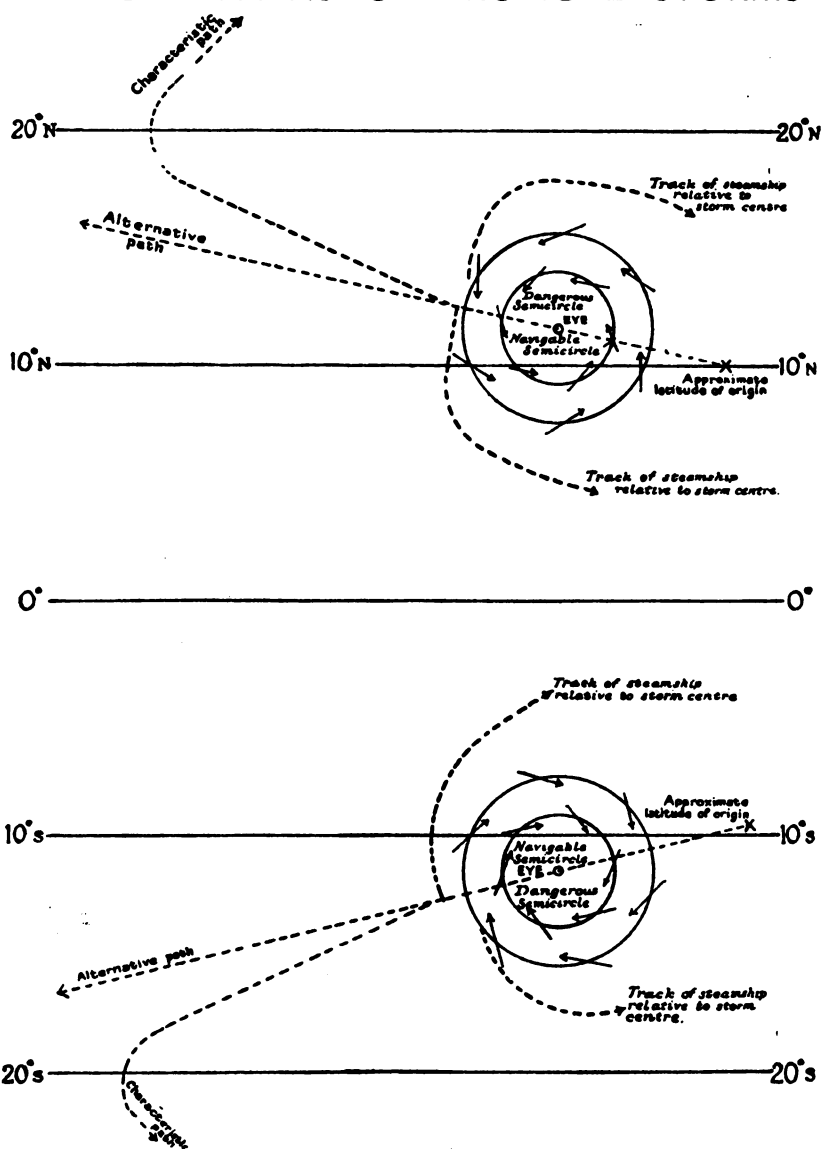
In the northern hemisphere.—(a) If the wind is veering, the ship must be in the dangerous semicircle. A steam or other power-driven vessel should proceed with all available speed with the wind 1 to
 30 4 points (depending upon her speed) on the starboard bow. A sailing vessel should heave to on the starboard tack. Either type of ship should haul round to starboard as the wind veers, thereby tracing a course relative to the storm as shown by the pecked line in the diagram.

(b) If the wind remains steady in direction, or if it backs, so that the ship seems to be nearly in the path (it is sometimes difficult to determine satisfactorily if indeed the ship is nearly in the path, particularly if in the dangerous semicircle, because the wind does not
 40 always behave according to rule) or in the navigable semicircle respectively, a steam vessel should bring the wind well on the starboard quarter and proceed with all available speed. A sailing vessel should run with the wind on the starboard quarter. Either type of ship should alter course to port as the wind backs, thus tracing a course relative to the storm as shown by the pecked line
 45 in the diagram.

In the southern hemisphere.—(a) If the wind is backing, the ship must be in the dangerous semicircle.—A steam or other power-driven vessel should proceed with all available speed with the wind
 50 1 to 4 points (depending upon her speed and that usual for a storm in this latitude) on the port bow. A sailing vessel should heave to on the port tack. Either type of ship should haul round to port as the wind backs, thereby tracing a course relative to the storm as shown by the pecked line in the diagram.

(b) If the wind remains steady in direction, or if it veers, so that
 55 the ship seems to be nearly in the path (it is sometimes difficult to determine satisfactorily if indeed the ship is nearly in the path,

TYPICAL PATHS OF TROPICAL STORMS



Note.—In this diagram the isobars are shown as concentric circles about the eye; in practice this is usually the case within 150 miles or so of the centre. Outside this distance the isobaric form often loses its symmetry and strong winds often extend farther on the polar side than on the equatorial.

particularly if in the dangerous semicircle, because the wind does not always behave according to rule). or in the navigable semicircle respectively, a steam vessel should bring the wind well on the port quarter and proceed with all available speed. A sailing vessel should run with the wind broad on the port quarter. Either type of ship should alter course to starboard as the wind veers, thus tracing a course relative to the storm as shown by the pecked line in the diagram.

If there is insufficient room to run, when in the navigable semicircle, and it is not practicable to seek shelter, a vessel should heave to with the wind on the starboard bow in the northern hemisphere, and on the port bow in the southern hemisphere.

If in harbour, or at anchor, a seaman should be just as careful as at sea in watching the shifting of the wind and estimating the movement of the storm relative to himself, as by so doing he will be able to shift his berth with advantage or otherwise act according to circumstances. It is far preferable, however, to put to sea, if this can be done in sufficient time to avoid the worst of the storm. Riding out a tropical storm, the centre of which passes within 50 miles or so, in a harbour or anchorage, even if some shelter is offered, is an extremely unpleasant and hazardous experience, especially if there are other ships in company. Only if berthed alongside, or if special moorings and long bridles are used, can a ship feel secure.

Discretion must, of course, be used. In the case of a low-powered or small vessel with, for example, insufficient warning to enable her to gain sufficient distance from the storm by putting to sea, it will be preferable to remain in a reasonably sheltered harbour. If at sea and warning of an approaching storm is given and there is considered to be insufficient time or sea room to avoid the dangerous part of the storm area, it may be advisable for vessels of this type to seek shelter. In the China Sea, for example, there are so-called typhoon harbours which are listed in the Admiralty Pilot. In all cases, however, the seaman must use seamanship and initiative.

(3) Local modification of the weather near the coast.—The information given in Chapter I on climate and weather in the area covered by the Pilot refers necessarily to the coastal and sea regions generally but cannot attempt to deal with the local effects on the wind and weather of each separate headland, bay, or creek. The following notes, however, should prove helpful in showing how the weather in the general vicinity is likely to be modified by the topography or shape of the land close to the actual place in which the mariner is concerned.

(i) If the coastline is steep-to, onshore winds that approach it at an angle are usually deflected nearly along the shore and increased somewhat in speed. And when the wind approaches a strait whose direction is somewhat similar to that of the wind, the wind tends to blow along the strait and increases in speed as the strait narrows.

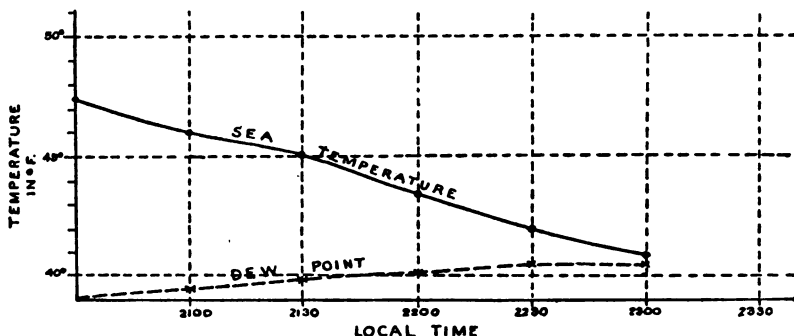
When a strong wind blows directly towards a very steep coast, there is usually a narrow belt of contrary gusty winds close to the coast.

(ii) Similarly when the wind blows onshore towards the entrance to a wide estuary, especially one with hills on both sides, it generally tends to blow up the estuary. This effect is most marked in the afternoon but there is often no such tendency during the night and early morning.

- (iii) An offshore wind is often squally on the lee side of hilly coasts, especially when the air is much colder than the sea, as for example when it blows off snow-covered land and when the wind over the open sea is force 5 or more.
 - (iv) Near headlands or islands with steep cliffs there may be large changes in direction (up to about 90°) and speed of the wind in addition to those mentioned above.
 - (v) During quiet and warm weather with clear or fairly clear skies, a sea breeze is of common occurrence during the warmer part of the day ; it is especially frequent in the tropics and subtropics. It blows onshore from, on the average, 4 to 8 hours after sunrise until shortly before sunset, reaching its maximum development during the afternoon (1300 to 1600) ; if there is an appreciable regional or general wind, then this will be modified by the onshore sea breeze. Under particularly favourable circumstances such as high day temperatures, relatively cool sea, and hilly background to coast, the sea breeze may blow as much as force 4 (occasionally 5) and extend 20 miles or more to seaward from the shore. At night under similar circumstances a lighter breeze blows from the land to the sea ; it seldom extends more than 5 miles from the shore nor does it become appreciable much before 2200 local time ; under favourable conditions, as in the tropics, it usually lasts until an hour or so after sunrise.
 - (vi) When sea fog that is caused by the passage of warm air over a colder sea surface is general over the open sea, visibility is better close to leeward of a hilly island or promontory than to windward. This effect is most marked in late spring and summer, during the early afternoon when the land is at its warmest, and this applies to low-lying land as well.
 - (vii) Radiation fog which forms over land on quiet nights with clear skies, mainly in autumn and winter, and sometimes spreads a few miles out to sea, is least thick during the afternoon and is often worst during the first hour or two after sunrise.
- (4) **Forecasting sea fog.**—The most frequent type of fog in the open sea is that caused by relatively warm air flowing over a colder sea. Warning of this type of fog may be obtained by frequent observations of air and sea surface temperatures ; if the sea temperature falls below the dewpoint of the air, fog is almost a certainty. The following procedure is recommended whenever the temperature of the air is higher than, or about equal to, that of the sea, especially at night when approaching fog cannot be seen until shortly before entering it.
- Sea and air (both dry and wet bulb) temperatures should be observed at intervals of about 5 miles and the sea temperature plotted against dewpoint. The dewpoint is obtainable from tables published in various text-books, but at temperatures up to about 60° F. a close enough approximation may be obtained by assuming it to be the same amount below the wet-bulb temperature as the latter is below the dry-bulb temperature ; for example, if the dry bulb reads 50° F. and the wet bulb 48°, the dewpoint is about 46°. If the curves of sea temperature and dewpoint converge, fog may be expected by the time at which they coincide.
- The figure below represents conditions that might be found by a low-powered ship in about long. 40° W. proceeding westward on the

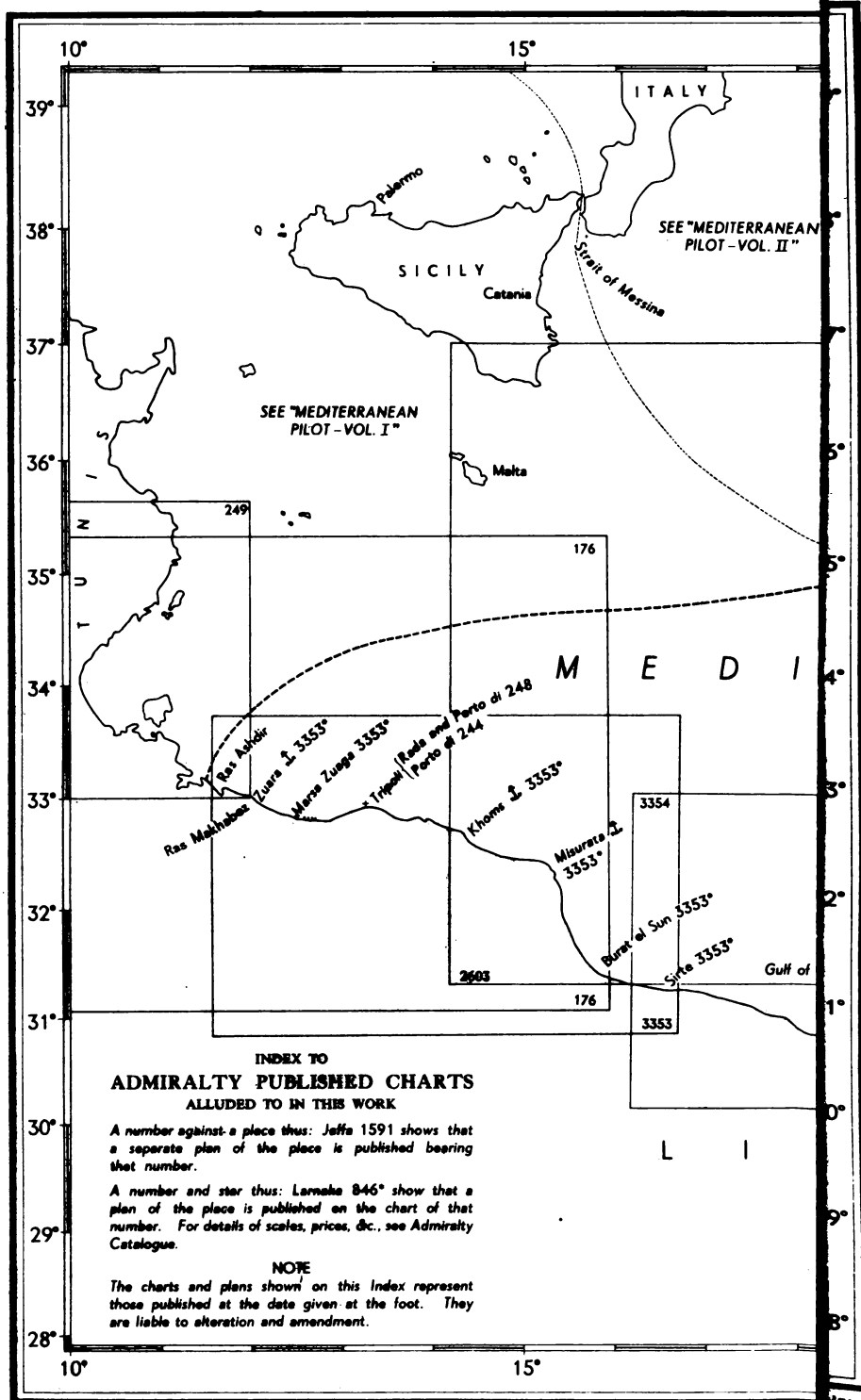
appropriate lane route for Halifax, Nova Scotia. At 2200 it would become evident that there is a probability of running into fog in about an hour's time, assuming that the sea temperature continues to fall at about the same rate that it has done during the last $1\frac{1}{2}$ hours.

- 5 From the appropriate chart of average sea surface temperatures it can be seen where a rapid fall of temperature may be expected, so that if the dewpoint is within 5° or so of the sea temperature when approaching the colder water zone, this will also give a fairly reliable warning of fog.



- 10 If it is desirable and practicable to escape from fog, a ship should steer for warmer water which will again be evident from the charted isotherms.

Fog, or very poor visibility, at sea may also occur in snow or heavy rain, or in association with the passage of a warm front or occlusion, or, when within 20 miles or so of land, it may occur as a result of radiation fog extending from the land; in high latitudes in winter, sea smoke may be met near land, when very cold offshore winds are blowing, or near extensive ice. The method described above will not give warning of these fogs, of which frontal fogs, though common in middle latitudes, are neither so extensive nor so persistent in any one locality, and the other fogs mentioned are rarely encountered far from land (or extensive ice).



IMPORTANT.

Details of Lights, Fog Signals, and Time Signals (visual) are not included in this volume; for this information the Admiralty List of Lights, Vol. V, should be consulted.

Information regarding Vertical Movement of the Water is not included; for this the Admiralty Tide Tables should be consulted.

Details of Radio information (weather bulletins, storm and navigational warnings, time signals, fog signals, and D.F. stations) are not included; for this information the Admiralty List of Radio Signals should be consulted.

MEDITERRANEAN PILOT

VOL. V

CHAPTER I

GENERAL REMARKS—LIBYA—EGYPT—SOUTHERN COAST OF TURKEY—
CYPRUS—SYRIA AND LEBANON—ISRAEL—CURRENTS—NATURAL PHENO-
MENA—BUOYAGE—SUBMARINE CABLES—AIR LIGHTS—SIGNALS—MINED
AREAS—RADIO STATIONS—COAL AND FUEL OIL—REPAIRS—CONSULS—
DERATISATION—STANDARD AND SUMMER TIMES—TUNNY FISHERIES—
CLIMATE AND WEATHER—CLIMATIC TABLES

LIBYA.—Libya, consisting of Tripolitania and Cyrenaica, lies between Tunisia and Egypt, and has an area of about 810,000 square miles, with a population, in 1950, of about 1,000,000. The coast is about 1,100 miles long between Rās Agedir (Ashdir) (*Lat. 33° 10' N., Long. 11° 34' E.*), on the west, and the eastern boundary, situated about one mile southward of Marsa er Ramla. From Rās Agedir it is generally low and sandy, with rocky reefs extending some distance seaward. The coast of the promontory of Derna, eastward of the Gulf of Sidra, is high, and thence it is high, or low, with sandhills, eastward to the eastern boundary.

Government.—Tripolitania is at present governed by the British Military Administration under a civil administrator residing at Tripoli (*Lat. 32° 54' N., Long. 13° 12' E.*). In 1949, H.H. Sayed Mohammed Idriss el Senussi was recognised as Amir and Head of the Government of Cyrenaica, the former British Chief Administrator at Bengàsi (Benghazi) being now known as the British Resident.

Harbours.—Tripoli harbour, Bengàsi, and Mersa Tòbruch (Tobruk) are the principal harbours; the other ports are open anchorages, or will only admit small craft.

Roadsteads.—**Caution.**—A vessel anchoring in the roadsteads of Libya during the winter season is recommended to leave the anchorage used by day for working cargo, and to anchor farther out during the night, as, at that time of the year there are strong winds, and occasionally gales, from the north-westward.

Production and Industry.—Tripolitania may be divided into three zones for agricultural purposes. The first, or coastal zone, is characterised by its suitability for cultivation of the olive; there are also date palms, numerous other fruit trees, cereals and vegetables.

The second or semi-desert zone, grows few trees, has a scanty pasturage, and some growth of barley.

The third, or desert zone, is only cultivated in the oases of Gadames and Fezzan.

- 5 Olives are grown both in the coastal plains and the highlands. Sheep and oxen are reared and silk-worms are cultivated.

In Cyrenaica the chief industry is agriculture, barley being the principle crop. Sheep rearing is general, fruit and vegetables are grown, especially on the table-lands.

- 10 Sponge fishing is carried on during the summer by numerous small craft. The tunny fisheries are extensive, the localities of which are described in the body of the book. There is a considerable salt industry in Cyrenaica and there are also salt works at Tripoli.

- Trade.**—The principal exports from Tripolitania are henna, sparto
15 grass, wool, hides, carpets, dates, sponges, tunny fish, and olive oil ; from Cyrenaica they are barley, wheat, sponges, hides, wool, mats, and tallow.

- Communications.**—There is regular steamer communication between the principal ports in Libya, and between Tripoli and
20 Malta. A regular air service operates between Tripoli, Bengàsi and Malta.

- A railway links Zuara (*Lat. 32° 56' N., Long. 12° 07' E.*) with Homs (Khoms) via Tripoli. There is a local rail connection between Bengàsi and Soluch (Soluk), about 30 miles south-south-eastward, and also
25 with Barce, about 24 miles southward of Tolemaide (Tolmeita).

A coastal road links Tunisia with Egypt.

Weights and measures.—Although the metric system has been adopted, the following weights and measures may still be used :—

- | | | |
|----|-------------|---------------------------------|
| | One oke | = 1.282 kilograms. |
| 30 | 40 okes | = one kantar = 58.28 kilograms. |
| | One draa | = 46 centimetres. |
| | One handaza | = 68 centimetres. |

- EGYPT.**—Egypt, the north-eastern part of Africa, extends westward from the Red Sea into the Libyan desert, and southward from
35 the Mediterranean to the parallel of 22° N. It also comprises the Sinai peninsula and the territory, eastward of the Suez Canal and Gulf of Suez, contained between the western shore of the Gulf of 'Aquaba and the southern boundary of Israel.

- The total area of Egypt is about 386,000 square miles, but the
40 cultivated and settled area, consisting of the Nile valley and delta, and oases, covers only about 13,578 square miles.

The population, in 1947, amounted to 19,090,000, mostly Moslems.

- Government.**—Egypt is under the rule of the King, who exercises legislative powers, concurrently with a Senate and Chamber of Deputies, and executive powers through a Council of Ministers.
45

Harbours.—Alexandria and Port Said are the only harbours available for large vessels. Mersa Matruh is small.

- Production and Industry.**—The principal products are cotton, wheat, barley, beans, lentils, onions, millet, rice, sugar cane, phosphate
50 rock, petroleum, manganese ore, silks, brass, silver, and copper ware, leather goods, pottery, perfumery, and cigarettes.

- Trade.—Shipping.**—The chief exports are vegetable, food, and mineral products. The principal imports are textiles, metals, manufactured goods, coal and coke, chemicals, machinery, vehicles, wood,
55 and paper.

In 1946, 11,091 vessels, with a tonnage of 42,664,324 tons, entered Egyptian ports.

Currency, weights and measures.—The monetary unit of Egypt is the Egyptian pound (£E) of 100 piastres = £1 0s. 6½d.; the piastre = 2·46d. and is divided into 10 milliemes. The Egyptian gold coins are the Egyptian pound and half-pound, but they have not been in circulation for some years; other coins in circulation are 20, 10, 5, and 2 piastre pieces in silver; one piastre piece and 2 and 5 milliemes in nickel; and one and one-half millieme in bronze.

In March 1939, the metre, kilogram, and litre were established as the weights and measures legal in Egypt. While in practice the old system will continue to be used, and is therefore given hereunder, the metric equivalents will have to be indicated.

1 cantar	=	99·0493 lbs.	
1 rotl	=	0·9905 lbs.	15
1 oke	=	2·75137 lbs.	
1 heml	=	550·274 lbs.	
1 ardeb	=	43·555 gallons.	
1 keila	=	3·63 gallons.	
1 rob	=	1·815 gallons.	20
1 kadah	=	3·63 pints.	
1 feddan	=	5024·16 sq. yds. or 1·038 acres.	

Communications.—There is regular steamer communication from Alexandria and Port Said with other Mediterranean ports; see pages 93, 109. There is a regular air service with Great Britain, the Cape and the Far East, also with Holland.

A coastal railway links all the principal ports between Tòbruch in Libya and Tripoli in Lebanon (*Lat.* 34° 28' N., *Long.* 35° 49' E.). This railway is connected to the main Egyptian railway system, which converges on Cairo, and also to the main line running between Istanbul and Damascus via Aleppo.

Canals.—There are over 700 miles of navigable waterways in the Nile delta, the principal of which are :—El Mahmudiya canal, 48 miles long, connecting Alexandria with the Rosetta branch of the Nile. The draught in the canal is limited to 4 feet (1^m2) during the winter closure, 4½ feet (1^m4) in summer, and 5 feet (1^m5) in flood. The Rayah Minufiya and El Baguriya canal, 70 miles long, linking up the Delta barrage with Quddaba on the Rosetta branch. The Bahr Shebin branches from the Rayah Minufiya, and connecting with the Rayah Abbassi, forms a waterway nearly 120 miles long from the Delta barrage to the sea. The Rayah Tewfiki and El Mansura canal, 65 miles long, joining the Delta barrage and El Mansura on the Damietta branch; and the Ismailia canal, 80 miles long, from Cairo to Ismailia.

The Rayah Behera, which leads from the Delta barrage along the left bank of the Rosetta branch of the Nile, a distance of 50 miles, has a better depth of water than the other navigable canals, but does not as yet open at its lower end into the Nile by a navigable passage.

The vessels using the above canals, with the exception of the Ismailia canal, have the following maximum dimensions :—

	Length feet	Breadth feet	Depth feet
Steam or motor barges .	130 (39 ^m 6)	23 (7 ^m 0)	6½ (2 ^m 0)
Cargo barges	98 (29 ^m 9)	20 (6 ^m 1)	6½ (2 ^m 0)
Tugs	72 (21 ^m 9)	15 (4 ^m 6)	5½ (1 ^m 7)
Country boats	72 (21 ^m 9)	20 (6 ^m 1)	6½ (2 ^m 0)

The Rayah Behera does not admit vessels exceeding 115 feet (35^m0) in length.

Navigation ceases on the Rosetta and Damietta branches of the Nile when the river falls below a certain level (13.30 and 30.60 metres, 5 respectively, as indicated by the gauge readings at the Delta barrage).

When the sadds (barriers) are constructed annually across the mouths of the two branches of the Nile for irrigation purposes, navigation to and from the sea is usually impossible between April and August.

10 **SOUTHERN COAST OF TURKEY.**—The southern coast of Turkey extends from Kara burun (Cape Alupo) (*Lat.* 36° 33' N., *Long.* 28° 01' E.) to the southern extremity of Qasab bay in the Bay of Antakya (Antioch), about 400 miles east-south-eastward. It consists mainly of the Toros Dağlar (Taurus range), which reaches an elevation
15 of about 8,700 feet (2,651^m8) at Ak dağ, situated about 18 miles north-north-eastward of Alaya, and about 11,800 feet (3,596^m6), about 40 miles northward of Mersin. On the southern side of the range there is a steep scarp, which generally falls sharply to the coast, but leaves room for a few alluvial deltas, and the fertile plains of Pamphylia
20 and Cilicia.

Agriculture is the principal industry. Supplies can be obtained at most of the anchorages, but not in any considerable quantity without previous notice.

On parts of the coast the gravel beach has become a solid petrified
25 mass, and caution is necessary in landing where there is any surf as the beach appears an ordinary one.

Ports.—The principal ports are Marmaris (Marmarice), Karaağac (Karaghatch), Fethiye (Fethieh), Kastelorizo, Antalya, Mersin, and Iskenderon (Iskanderún).

30 Eastward of Kalidonya burnu (*Lat.* 36° 12' N., *Long.* 30° 27' E.) there are many open roadsteads which afford safe anchorage in summer. Yurmurtalık limanı (Ayas bay) in Iskenderon körfezi (Gulf of Iskanderún) affords shelter to large vessels.

Sea level.—There is no tidal rise on the southern coast of Turkey, but
35 southerly and westerly winds raise the level of the sea sometimes as much as 2 feet (0^m6), and northerly and easterly winds lower it similarly, above and below the normal.

Communications.—There is a railway from Mersin to Adana, a distance of 36 miles, where it connects with the railway to Baghdad
40 from Istanbul, and with that to Damascus from Istanbul via Aleppo.

Currency, weights and measures.—The monetary unit is the Turkish pound or lira (₺) = 100 piastres. 1 piastre = 40 paras. The coins in circulation are 10 and 20 paras and one piastre.

CYPRUS.—The island of Cyprus, situated in the north-eastern
45 part of the eastern basin of the Mediterranean, has an area of about 3,584 square miles.

Two mountain ranges run generally east and west through the island. The southern range, which is the more extensive and lofty, culminates in Mount Troodos (ancient *Olympus*), 6,403 feet (1,951^m6)
50 high, situated about 30 miles east-south-eastward of Cape Arnauti, the north-western extremity of the island; farther eastward are Mounts Adelphi, 5,290 feet (1,612^m4); Papoutsas, 5,098 feet (1,553^m9); and Kionia (Chionia) 4,659 feet (1,420^m1); and the range ends in the isolated peak, Stavrovouni (the Olympus of Strabo), 2,258 feet

(688^m2) high, 10 miles westward of Larnaca. The northern range, the western part of which is the Kyrenia mountains, and the eastern part the Karpass mountains, extends from Cape Kormakiti to Cape Andreas, a distance of nearly 90 miles ; its highest point is Buffavento castle, 3,131 feet (954^m4) high (*Lat.* 35° 17' N., *Long.* 33° 26' E.). 5

The Mesaoria is a broad treeless plain, which extends across the island from Morphou bay to Famagusta bay, a distance of 50 miles, with a width of from 8 to 18 miles. The streams which traverse it are winter torrents, which descend northward from the southern range, but scarcely reach the sea. The Pedieo and Yalias run into a reser- 10
voir, the water being used for irrigation purposes ; the Pedieo rises near Kionia and passes close to Nicosia ; the Yalias rises a little eastward of the source of the Pedieo, passes through Nisou, Dhali (ancient *Idalion*), and Pyroi, and traverses the Mesaoria in directions more or less parallel to the Pedieo. The Karyotis, which flows from 15
the slopes of Troodos into Morphou bay, and the Dhiarrizos, which flows into the sea near Kouklia, are smaller but more constant streams.

The island is subject to drought, although water is plentiful below the surface in the valleys and plains.

The population of the island by the census of 1946 was 462,318. 20
Nicosia, near the middle of the island, with a population of 34,463, is the capital. The other principal towns are Limassol, Larnaca, Famagusta, Paphos and Kyrenia.

Government.—Cyprus is a British Colony, having been annexed to His Majesty's Dominions by Order in Council on the 5th November, 25
1914. It became formally a Crown Colony in 1925. The administration is in the hands of a Governor assisted by an Executive Council.

For administrative purposes the island is divided into six districts, in each of which the executive government is represented by a Com- 30
missioner.

Harbours.—Cyprus possesses no harbours capable of accom-
modating the largest vessels, but ships up to about 7,000 tons can be
berthed in the harbour at Famagusta (*Lat.* 35° 08' N., *Long.* 33° 56' E.).
and up to about 5,000 tons can load from the pylon in Vasilikos bay. 35
See page 175. The existing harbours at Limassol, Larnaca, Port
Paphos, Kyrenia, New Soli, and Latzi consist of jetties for small craft,
and open roadsteads ; Limassol and Larnaca are, however, safe,
even in winter, for vessels provided with efficient anchors and cables.
There are also a few anchorages in open bays around the coasts. 40

Products.—The principal agricultural products are wheat, barley,
potatoes, onions, cotton, pulse crops, linseed, aniseed, cummin, carrots,
vine products, fruit, olives, silk, cheese, and wool. Mules, donkeys,
and pigs are bred.

Trade.—Shipping.—The most important exports are cupreous 45
concentrates, carobs, pyrites, potatoes, asbestos, fruit, wine, leaf
tobacco, hides and skins, wool, and donkeys. The principal imports
are wheat, barley, beans and peas, rice, flour, condensed milk, coffee,
confectionery, fish, edible oils and fats, sugar, hardware, electrical
goods, petroleum, textiles, glass and earthenware, and motor cars. 50

In 1948, 3,575 vessels, with a total tonnage of 2,973,572 tons, entered
the various ports of Cyprus. In addition there were 1,676 vessels,
with a total tonnage of 846,390 tons engaged in the coastal trade.

Communications.—A narrow-gauge railway links Famagusta to
Nicosia, the capital, and to Morphou New Soli and Kalokhorio, the 55
latter situated about 3½ miles south-eastward of Karavostasi (*Lat.*

35° 08' N., Long. 32° 49' E.). The principal towns are connected by good motor roads and there are regular motor car services between Nicosia and the other towns and principal villages.

There is regular steamer communication with ports in the Mediterranean and with Syria, Lebanon, and Israel ; also between the principal ports of the island.

There is regular air service between Nicosia, Athens, Beirut, Cairo, Istanbul, Teheran, and Rome and also with the United Kingdom.

All the principal towns are connected to the general telegraph and telephone systems.

Currency, weights and measures.—The currency is British gold coins, though gold is now rarely seen. Cyprus currency notes are of £5, £1, 10s., 5s., 2s., 1s., and 3 piastres ; silver coins of 45, 18, 9, 4½ and 3 piastres ; bronze and nickel coins are of 18, 9, 1, ½ and ¼ piastres. The monetary unit is the piastre of which 180 = £1.

The following weights and measures are in use :—

	1 oke = 400 drams = 2·8 lbs.
	5 okes = 1 stone
	44 okes = 1 Cyprus kantar
20	180 okes = 1 Aleppo kantar
	800 okes = 1 ton
	1 pic = 2 feet
	33 pics = 1 chain
	2,540 pics = 1 mile.

25 **SYRIA AND LEBANON.**—Syria and Lebanon became independent sovereign states in 1944, governed in each case by a President and Council of Ministers. Both countries are essentially agricultural and there are few minerals but some iron and lignite.

Physical features.—Syria and Lebanon may be divided into three parallel belts, running roughly north and south, as follows :—The Maritime range with its broken coastal plain ; the Central depression, and the Eastern plateau, of which the first only affects this work.

The Maritime range is divided into three sections by deep gorges at nearly equal intervals. From north to south there are the Amanus mountains between the Jihān and the Nehir el'Asi or Orontes rivers, Jebel Ansariya between the Nehir el'Asi and Tripoli, and the Lebanon between Tripoli and Tyre (Lat. 33° 16' N., Long. 35° 10' E.). The western slopes are not generally steep and form the most productive part of the country.

Rivers.—The Orontes river flows northward from the Lebanon range across the northern boundary of Syria to Antakya (Turkey) and thence debouches into the Bay of Antakya, about 5 miles south-south-eastward of Rās el Mina. The river Euphrates also crosses the northern boundary of Syria near Jerablus, and flows through north-eastern Syria to the boundary of Iraq.

Syria.—The republic of Syria has an area of approximately 55,700 square miles, with a population, in 1945, of 2,000,000, Arabic speaking and mostly Moslems. It is bounded on the north by Turkey, on the east by Iraq, on the south by the Hashemite Kingdom of the Jordan and Israel, and on the west by Lebanon. Its coastline is included between the southern extremity of Qasab bay in the Bay of Antioch and the En Nahr el Kebir.

Production and Industry.—Agriculture and cattle breeding are the principal industries. Wheat and barley are the main cereal

crops ; tobacco and cotton are also grown. Skins and hides, leather goods, wool, silk, copper and brassware are locally produced.

Trade.—The principal exports are wool, olive oil, silk, textiles, cotton, eggs, wheat, barley, tobacco, liquorice, maize, onions, butter, and apricots. The chief imports are cotton and woollen textiles, artificial and cotton yarns, iron and steel goods, petrol, oils, wood, chemical products, raw hides, sugar, coal, motor vehicles and paper. 5

Port.—Latakia.

Lebanon.—The republic of Lebanon has an area of about 4,300 square miles, with an estimated population, in 1948, of 1,250,000. 10 Arabic speaking, Christians, Moslems, and Druses. It forms a strip, about 120 miles in length, varying in width from 30 to 35 miles along the Mediterranean littoral, extending from the Israel frontier on the south to the Nahr el Kebir on the north. Its eastern boundary runs down the Anti-Lebanon range and then down the Great Central 15 depression, known as the Beqaa, in which flow the rivers Nehir el' Asi and Litani.

Production and Industry.—Fruits and olives are the most important products. Tobacco, silk and cotton are also cultivated. Little now remains of the famous cedars of Lebanon. 20

Trade.—The principal exports are wool, olive oil, textiles, eggs, fruits, liquorice, wheat, barley, maize, onions, tobacco, soap, butter, and carpets. The chief imports are gold, precious metals, cereals, cotton and woollen textiles, cotton and artificial yarn, iron and steel goods, petrol, oils, wood, chemical products, raw hides, sugar, motor 25 vehicles and livestock.

Ports.—Beirut, Tripoli (*Lat. 34° 26' N., Long. 35° 50' E.*), Tyre, and Sidon.

Communications.—For railway communications in Syria and Lebanon, *see* page 3. There is regular steamer communication with Great Britain and Mediterranean ports, and a regular service by air with Marseilles. 30

Currency.—Weights and Measures.—These are the same for both Syria and Lebanon, the monetary unit being the Syrian £, divided into 100 piastres. 35

The metric system became obligatory in August 1935, but in out-lying districts the former weights and measures may still be in use. They are as follows :—

One okiya	= 0·47 lb.	
6 okiyas	= one oke	40
2 okes	= one rottol	
200 okes	= one kantar.	

ISRAEL.—The republic of Israel lies at the eastern end of the Mediterranean between *Lats. 20° 30' N. and 35° 15' N., and Longs. 34° 15' E. and 35° 40' E.* It is bounded on the north by Lebanon, on the east by the Hashemite Kingdom of the Jordan, and on the south 45 by the Egyptian province of Sinai. It embraces an area of approximately 10,429 square miles and had, in 1948, an estimated population of 1,912,000.

Government.—Israel is governed by an Executive Council, nominated by the leading political party, and appointed by the President, and a Constituent Assembly, known as Knesseth Israel, of 120 members. The capital and seat of Government is at Tel Aviv. 50

Ports.—Acre, Haifa, Tel Aviv, and Jaffa (*Lat. 32° 03' N., Long. 34° 45' E.*). 55

Production and Industry.—The country is generally fertile and climatic conditions vary so widely that a large selection of different crops can be grown. The main winter crops are wheat and barley, and in the summer, sorgham, millet, maize, sesame, and summer
5 pulses are grown. Olives are extensively cultivated, mainly for edible oil and the manufacture of soap. The main industries are manufactured food products, metals, chemicals, textiles, and jewellery, including diamond cutting and polishing. The mineral resources await development.

10 **Trade.—Shipping.**—The principal exports are citrus fruits, soap, olive oil, potash and bromine, knitted goods, artificial teeth, kerosine, benzine, solar oils, and polished diamonds. The chief imports are seeds, beans, nuts for oil, crude petroleum, rough diamonds, drugs, medicines, grain, flour, textiles, motor cars and tyres.

15 In 1946-47, 2,354 steam vessels, with an aggregate tonnage of 5,235,300 tons, entered the ports of Israel.

Communications.—There is railway communication with Egypt and the Hashemite Kingdom of the Jordan, and the principal ports and towns are connected to the railway system. See also page 3.

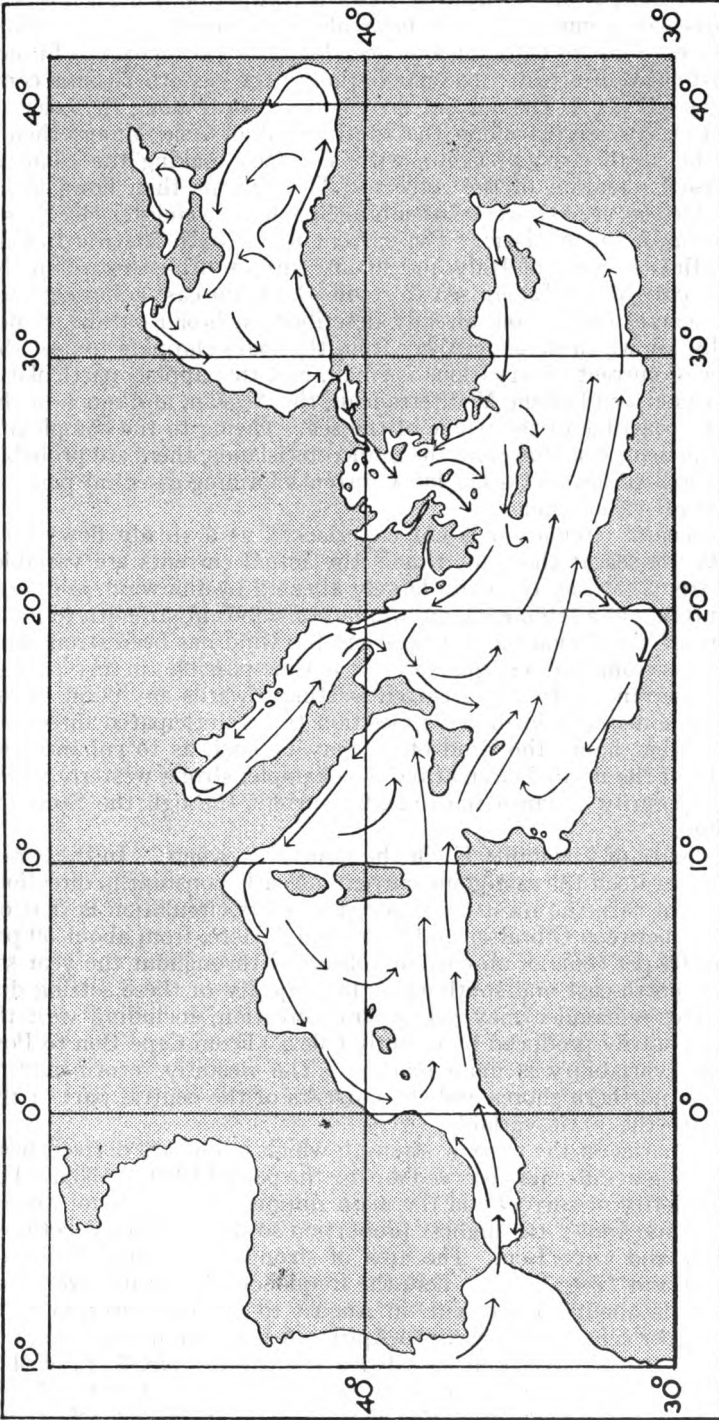
20 Lydda, about 25 miles east-south-eastward of Jaffa (*Lat.* 32° 03' N., *Long.* 34° 45' E.) is the principal airport, and there are regular air services between the United Kingdom and Australia, and between Athens and Teheran. There are also air services to Cairo, Bagdad, Beirut, and Cyprus.

25 **CURRENTS.—General remarks.**—The Mediterranean sea receives, from the rivers which flow into it, only about one-third of the amount of water which it loses by evaporation. In consequence, there is a continuous inflow of surface water from the Atlantic ocean, derived from the Portugal current. After passing through Gibraltar
30 strait, the main body of the incoming surface water flows eastward along the north coast of Africa. This current is the most constant part of the circulation of the Mediterranean, but it gradually loses strength as it penetrates eastward. After passing Cape Bon, it continues in a south-easterly direction towards the most northerly part
35 of the coast of Cyrenaica, in about *Long.* 22° E. It flows thence in an east-south-easterly direction, becoming easterly off the Egyptian coast, and subsequently turns northward along the coast of Israel.

A small amount of water also enters the Mediterranean from the Black sea as a surface current through the Bosphorus, Sea of Marmara,
40 and the Dardanelles.

By evaporation, the Mediterranean water becomes more saline, with a corresponding increase in density. It therefore sinks and the excess of this denser bottom water emerges into the Atlantic ocean, over the sill forming the shallow Strait of Gibraltar, as a west-going
45 sub-surface current below the east-going surface current. A small quantity of water also emerges as a sub-surface current flowing through the Dardanelles, Sea of Marmara, and Bosphorus into the Black sea, beneath the stronger surface current flowing in the opposite direction.

The western and eastern basins of the Mediterranean are separated
50 by Italy and Sicily, and are connected only by Malta channel and the narrow Strait of Messina. The fundamental surface circulation of the Mediterranean therefore consists of a separate counter-clockwise movement of the water in each of the two basins, with the main east-going current through Malta channel common to both. The circula-
55 tion is shown in broad outline on page 9.



GENERAL SURFACE CURRENT CIRCULATION OF THE MEDITERRANEAN

The circulation of the western basin is formed by a branch of the main east-going current, which flows along the north coast of Sicily, up the west coast of Italy, and thence along the south coast of France and east coast of Spain. The circulation of the eastern basin is completed as follows :—The current flowing northward along the coast of Israel turns westward along the south coast of Asia Minor, thence along the north coast of Crete, with a branch making the counter-clockwise circulation of the Aegean. The current then flows along the western coast of Greece, with a branch making a counter-clockwise-circulation of the Adriatic. The current flows south-westward along the south-east coast of Italy and finally turns south-eastward in the western part of the Ionian sea to rejoin the main east-going current.

The general circulation, already described, in broad outline, is not yet fully known in detail. Away from the main shipping routes, the number of current observations is small, and this applies particularly to the eastern end of the Mediterranean, the Aegean, and much of the northern coastline of the whole of the sea. Owing to the complexity of the northern coastline, and the numerous islands, there are probably many small eddies and other local currents forming essential parts of the general circulation.

The general circulation is not experienced as a steady flow in all parts of the sea at the same time ; the actual currents are variable. The currents, at any time, are largely affected by the wind, and local drift currents of a temporary nature, but of sufficient strength to mask the general circulation, are set up when the wind has been strong and continuous from any one quarter. It is thus possible, in any part of the Mediterranean, to find a current setting towards any point of the compass, sometimes in direct opposition to its anticipated direction. On the other hand, the wind effect may be such as to enhance the strength of the normal circulation, for example, strong westerly winds will temporarily enhance the in-going current through the Strait of Gibraltar.

The degree of variability is not the same everywhere. In the Strait of Gibraltar itself the east-going current is nearly constant in direction. Apart from this, the most constant part of the circulation is that on the route between Gibraltar and Cape Bon. Here, from about 50 per cent. to 65 per cent. of all currents observed throughout the year set between north-east and south-east, the majority of these setting due east. The remainder may set in any direction, including westerly sets temporarily produced by easterly gales. From Cape Bon to Port Said, the variability is more marked. The westerly return current along the northern shores and the currents of the central part of the basins are the most variable.

The remarks on the current strength which follow are derived from the charting of currents observed during the period 1910 to 1939. The great majority of currents on the main shipping routes do not exceed a rate of one knot ; the highest proportion so doing is found between Gibraltar and Cape Bon. The area of strongest current is between Gibraltar and *Long. 2° W.* ; here the frequency of currents exceeding one knot is about 25 per cent. in August to October, decreasing to about 10 per cent. in February to April. A few currents of from 2 to 3 knots and over have been recorded westward of *Long. 2° E.* in May to January ; the majority of these occur westward of *Long. 2° W.*

Libya.—In the vicinity of Rās el-Hamama (*Lat. 32° 56' N., Long. 21° 37' E.*), and Rās Aamer, the main east-going current of the Mediterranean divides. The chief part continues eastward, its southerly

edge trending in towards the coast, at an average rate of about half a knot, towards Râs el-Hilal, and thence towards Râs et-Tin, increasing in strength. Eastward of Râs et-Tin, the current continues to set eastward, towards the Gulf of Salûm, but, on this more deeply indented coast, is not usually felt near the coast. During strong easterly gales, the current eastward of Râs el-Hamama may be found temporarily setting westward. 5

The other branch of the east-going current turns in a southerly direction from Râs el-Hamama towards Bengâsi; its rate is usually small as far as Râs Tolemaide (Tolmeita), 37 miles west-south-westward of Râs el-Hamama, after which it strengthens to a rate of from three-quarters of a knot to one knot. With strong north-north-easterly winds this rate is sometimes increased to 2 knots, while with strong south-westerly winds the current is greatly reduced, or may cease altogether. 15

The prevailing current in the open waters of the Golfo della Sirte, or Sidra, is stated to be southerly, at a rate of from one-quarter to three-quarters of a knot, but observations are lacking and it is probable that there is a large variation of direction, according to the wind.

Along the southern coast of the Gulf of Sidra, and westward as far as Marsa Zliten (Ziliten) (*Lat.* $32^{\circ} 28' N.$, *Long.* $14^{\circ} 36' E.$), the general direction of current is north-westward for the greater part of the year; in winter, during the prevalence of strong winds between south-west and north-west, this current is reversed to south-easterly. The north-westerly current, however, is rarely felt off Tripoli, where a flow to south-eastward usually occurs throughout the year. No observations are available south of the main shipping route to Port Said, but it is probable that the north-westerly coastal current is finally diverted from the coast in northerly and easterly directions, thus recurving back into the main east-going current to the northward. 20 25 30

Egypt.—The general east-going current passes the coast of Egypt. During the rising of the Nile, which commences in June and ends in September, the easterly current off the coast of the Nile delta is much influenced by the water flowing into the sea, and often becomes variable off the Damietta mouth, but the general set is still eastward. 35

Israel. — Lebanon. — Syria. — Southern coast of Turkey. — The direction and rate of the currents in this part of the Mediterranean are not yet fully known. The general easterly current on the north coast of Africa turns north-eastward and northward on the coasts of Israel, Lebanon, and Syria, where it becomes weak and variable and is affected by the winds, so that it sometimes sets southward; the rate of the northerly current occasionally exceeds one knot with strong westerly winds. 40

Sailing vessels proceeding southward off the coast of Israel frequently anchor between Cape Carmel (*Lat.* $32^{\circ} 50' N.$, *Long.* $34^{\circ} 58' E.$) and El 'Arish during the summer when the northerly current is strong and the wind light. 45

The current on the southern coast of Turkey, unless affected by gales, generally sets westward, its rate increasing as the distance from the coasts of Syria and Lebanon becomes greater. A short distance from the land it is weak, but closer to the coast its rate is occasionally considerable. 50

Cyprus.—During June, July, and August, the current usually sets eastward off the north coast of Cyprus, a rate of one-half to one knot, increasing with strong south-westerly winds to 2 knots. Off the west 55

and south coasts, between Cape Arnauti and Cape Kiti, the current generally sets eastward at a rate of from one-half to three-quarters of a knot. On the south-eastern coast, between Cape Kiti (*Lat. 34° 49' N., Long. 33° 36' E.*) and Cape Andreas, the current generally sets 5 westward but is much affected by the wind.

NATURAL PHENOMENA.—Marrobbio.—These consist of waves or surges, isolated or in series, which may raise the sea level by 2 or 3 feet (0^m6 or 0^m9), during undisturbed weather. The period of the waves varies from 10 to 26 minutes. They are most marked on 10 the south-western coast of Sicily, but they occur all along the western, southern, and eastern coasts and round the islands between Sicily and the coast of Africa, and also on the latter coast in the vicinity of Tripoli harbour. They are known as Marrobbio, Marrubbio, and Carrobbio in different localities of Sicily. Their origin is probably associated with 15 fairly abrupt changes in the meteorological conditions prevailing in the Mediterranean as a whole, and not necessarily with changes in local conditions.

Mirage.—See page 28.

Caution.—During February, March, and April, mean sea level in 20 the central Mediterranean may fall as much as 1½ feet (0^m4) below normal.

BUOYAGE.—It is expected that, in certain localities, the buoyage systems, as given hereunder, will eventually be altered to conform to the new Uniform system. Admiralty publications will be amended as 25 new information becomes available. The body of this book should invariably be consulted.

Syria and Lebanon.—The following system of buoyage includes, with the exception of lighthouses and light-vessels, all marks, fixed or floating, which serve by day to indicate the following:—The lateral 30 limits of navigable channels as well as the alignment of the axes of the channels; natural as well as other dangers, such as wrecks; limits of quarantine anchorages; the outlets of sewers or pipe-lines; and areas used by the respective Governments and other authorities.

All the marks included in this system are characterised by their 35 colour and shape of their topmarks or by their colour and shape.

The term *starboard hand* means the right-hand side approaching from seaward; the term *port hand* means the left-hand side. The term *separation marks* is applied to the marks placed at the seaward extremity of middle grounds, and the term *junction marks* to those at 40 the inshore extremity of middle grounds. Marks placed on shoals of small extent are termed *isolated danger marks*.

1. *Starboard hand marks* are painted red, and surmounted by a topmark of conical shape; if necessary, they are numbered with even numbers commencing from seaward.

45 2. *Port hand marks* are painted black, and surmounted by a topmark of cylindrical shape; if necessary, they are numbered with odd numbers commencing from seaward.

3. *Separation marks* are painted in black and white horizontal bands, and surmounted by two cones, bases together.

50 4. *Junction marks* are painted in red and white horizontal bands, and surmounted by two cones, points together.

5. *Isolated danger marks* are painted in red and black horizontal bands, and surmounted by a spherical topmark.

6. *Wreck marks* are painted green, and surmounted by a topmark

of one of the shapes mentioned in the preceding articles 1, 2, 3, 4, and 5, according to the position.

7. *Quarantine anchorage marks* are conical in shape and painted yellow.

8. Buoys marking the outlets of sewers or pipe-lines are conical in shape, and painted with the upper half yellow and the lower half black. 5

9. Buoys marking areas used by the respective Governments and other Authorities are conical in shape and painted white with two blue diagonal bands, with a cross on top and, if necessary, the letters **Z.D.** in red, indicating a dangerous zone. 10

10. Leading marks for navigable channels are painted, the front mark with black and white vertical stripes, and the rear mark with red and white vertical stripes. If necessary, these marks are surmounted by a black or red cross, respectively.

Italy.—Buoys and beacons are painted *red* on the *port hand*, and *black* on the *starboard hand*, entering a port or channel from seaward. 15

Egypt.—When approaching from seaward all *starboard hand* buoys are conical, and all *port hand* buoys can.

Turkey.—The starboard side of a channel is considered to be that side which is on the starboard side of a vessel entering a port, or proceeding with the flood tide. 20

Starboard hand buoys are conical and painted red; *port hand* buoys are truncated conical and painted black.

Spherical buoys are placed at the end of central dangers and, if necessary, on each side. The outer buoy is surmounted by a diamond, 25 and the inner buoy by a triangle.

Mooring buoys are cylindrical in shape, painted red and numbered.

Telegraph cable buoys are black and carry a white inscription.

Submarine mining buoys are barrel buoys painted in red and white bands. 30

Wreck buoys are white and carry a white inscription.

Fixed beacons on the land, or on isolated dangers, carry various topmarks.

SUBMARINE CABLES.—The following Articles are taken from the International Convention for the protection of Submarine Telegraph cables, of 14th March, 1884. 35

II. It is a punishable offence to break or injure a submarine cable, wilfully or by culpable negligence, in such manner as might interrupt or obstruct telegraphic communication, either wholly or partially, such punishment being without prejudice to any civil action for 40 damages.

This provision does not apply to cases where those who break or injure a cable do so with the lawful object of saving their lives or their ship, after they have taken every necessary precaution to avoid so breaking or injuring the cable. 45

V. Vessels engaged in laying or repairing submarine cables shall conform to the regulations as to signals which have been, or may be, adopted by mutual agreement among the High Contracting Parties, with the view of preventing collisions at sea.

When a ship engaged in repairing a cable exhibits the said signals, 50 other vessels which see them, or are able to see them, shall withdraw to or keep beyond a distance of one nautical mile at least from the ship in question, so as not to interfere with her operations.

Fishing gear and nets shall be kept at the same distance.

Nevertheless, fishing-vessels which see, or are able to see, a telegraph- 55

ship exhibiting the said signals, shall be allowed a period of twenty-four hours at most within which to obey the notice so given, during which time they shall not be interfered with in any way.

The operations of the telegraph-ships shall be completed as quickly as possible.

VI. Vessels which see, or are able to see, the buoys showing the position of a cable when the latter is being laid, is out of order, or is broken, shall keep beyond a distance of one-quarter of a nautical mile at least from the said buoys.

10 Fishing nets and gear shall be kept at the same distance.

VII. Owners of ships or vessels who can prove that they have sacrificed an anchor, a net, or other fishing gear in order to avoid injuring a submarine cable, shall receive compensation from the owner of the cable.

15 In order to establish a claim to such compensation, a statement supported by the evidence of the crew, should, whenever possible, be drawn up immediately after the occurrence; and the master must, within twenty-four hours after his return to or next putting into port, make a declaration to the proper authorities.

20 The latter shall communicate the information to the Consular authorities of the country to which the owner of the cable belongs.

Caution.—Cautionary notes appear on many charts, calling attention to areas in which there are submarine telegraph cables; these areas are indicated by pecked lines on the charts.

25 Every care should be taken to avoid anchoring in such areas, even though there may be no specific prohibition against so doing, in view of the serious interference with communications which results from damage to submarine cables: Equal care should be taken whenever the symbol for a submarine cable (a wavy line) is shown on the chart.

30 *Danger involved in cutting a submarine cable to clear anchors or fishing gear.*—In the event of any vessel fouling a submarine cable, every effort should be made to clear the anchor or gear by normal methods; should these efforts fail, the anchor or gear should be slipped and abandoned *without attempting to cut the cable. High voltages are, or*
 35 *may be, fed into certain submarine cables; serious risk exists of loss of life due to electric shock, or at least of severe burns if any attempt to cut the cable is made.* No claim in respect to injury or damage sustained through such interference with a submarine cable will be entertained.

40 Compensation for anchors or fishing gear sacrificed in order to avoid injuring a submarine cable can be claimed under the Submarine Telegraph Act of 1885 (Schedule of Submarine Telegraph Convention, Article VII).

AIR LIGHTS.—Mariners are warned that lights (with definite characteristics), which are not ordinary navigational aids, may be
 45 exhibited for the use of aircraft from structures near the coasts described in this volume.

These lights are often of great luminous power and altitude and may be the first lights or looms of lights sighted when making a land-fall at night; they normally have the following characteristics:—

50 (a) *Flashing White* (revolving beam type).

(These lights are usually screened from seaward but their looms may be visible.)

or (b) *Alternating flashing white and green* (revolving beam type).

or (c) *Flashing two letter groups* in the Morse Code, in *red* or *green*.

55 (Although the groups made by these lights may have

definite meanings in the International Code of Signals, their signification is to be disregarded ; the fact that they are *red* or *green* in colour, and flash with mechanical regularity, should prevent their being mistaken for signals from shore signal stations or ships.) 5

Air lights which appear likely to be visible from seaward will be shown on charts and described in the Admiralty Lists of Lights. As they are subject to changes of which prompt notification to the mariner may not always be possible, care should be taken that they are not confused with marine navigational aids. 10

SIGNALS.—Signals to be made when inconvenienced by searchlights.—In the event of the navigation of a vessel being inconvenienced by the glare from searchlights near a port in the British Empire, she should make the International Code signal ZO (— — • • — — —) by lamp and by whistle, siren or fog horn. 15

Both the light and sound signals should be employed, whenever possible, and should be repeated until the inconvenience is removed.

Only real urgency should necessitate the use of this signal, as unless the vessel is actually in the rays of a searchlight, it is not possible for the operators to know which projector is affected. 20

This signal is designed to assist mariners ; no liability whatever will be admitted.

This signal should also be used in similar circumstances near ports in other countries.

MINED AREAS.—Caution.—Vessels navigating in those areas 25 which are declared danger areas owing to the existence of mines should keep strictly to the directions contained in **NEMEDRI**. This publication gives routes through these declared danger areas and all information required for their safe navigation.

RADIO STATIONS.—Coastal radio stations in the area covered 30 by this volume, which are open for public correspondence, are established at Tripoli, Bengàsi, Derna and Tòbruch, in Libya, Alexandria, Larnaca, Beirut (Beyrouth in International List) and Haifa.

For details of the above-mentioned stations, see List published by the General Secretariat of the International Telecommunication Union. 35

For details of Radio stations which transmit weather bulletins, storm signals, navigational warnings, time signals, etc., see Admiralty List of Radio Signals.

COAL AND FUEL OIL.—Coal and fuel oil may be obtained at Alexandria, Port Said, Alexandretta, Beirut, Haifa, and Iskenderon ; 40 coal only may also be obtained at Tripoli in Lebanon and Jaffa.

REPAIRS.—There are one dry dock and three patent slips at Alexandria and a floating dock and seven patent slips at Port Said. See Appendix I.

Repairs can be carried out at Alexandria and Port Said. 45

CONSULS.—There are British Consular officers at Alexandria, Port Said, Iskenderon, Beirut, Haifa, Tel Aviv, and Tripoli in Lebanon.

DERATISATION.—In accordance with Article 28 of the International Sanitary Convention of 21 June, 1926, Deratisation can be

carried out and Deratisation and Deratisation Exemption certificates can be issued to vessels at the following ports :—Tripoli in Lebanon, Beirut, Haifa, Alexandria, Mersin, Antalya (Adalia), Port Said (for medium-sized vessels only) and, for vessels up to 100 tons, Antalya 5 (Adalia), Alexandretta, Fethiye (Fethieh), Ruad Shiq'a, Sidon and Tyre. Deratisation of sailing vessels can be carried out and Deratisation certificates issued at Damietta, Fethiye and Rosetta. Deratisation can be carried out and Deratisation certificates issued, for vessels not exceeding 220 tons, at Limassol, Larnaca and Fama- 10 gusta. Exemption certificates for vessels of any size can also be issued at these places.

STANDARD AND SUMMER TIMES.—All information regarding Standard Times and Summer Times will be found in the Admiralty List of Radio Signals, Vol. II.

15 **TUNNY FISHERIES.**—During certain seasons of the year fishing nets of large size (madragues or tonnara) are moored in places off the coast of Libya for the purpose of catching tunny fish. The nets are sometimes upwards of $4\frac{1}{2}$ miles offshore, and should be avoided.

The prescribed marking for all tunny fisheries are as follows :—

- 20 By day.—Two balls placed vertically not less than 6 feet (2^m0) apart, the upper one red, the lower white, shown from boats or floats moored seaward of the central outer portion of the main nets or the return (whichever extends farthest), at a height of not less than 16 feet (5^m0) above the sea.
- 25 By night.—Two lights, *red* above, *white* below, visible not less than 2 miles, shown in place of the above balls.

Tunny nets which do not extend more than $1\frac{1}{2}$ cables from the coast and are not placed in a position traversed or frequently anchored in by shipping, are exempt from showing the prescribed night signals.

- 30 On the coast of Tripolitania practical difficulties may temporarily prevent the proper marking of tunny fisheries and may affect their dimensions and position. Generally, such fisheries are allotted an extent of water measuring about 3 miles along their front, $5\frac{1}{2}$ miles on their western side and half a mile along their eastern side. When these 35 nets are laid out, in order to avoid the possibility of fouling them, vessels should keep not less than 6 miles from the coast and exercise great caution when entering or leaving a port.

CLIMATE AND WEATHER.—Over that part of the Mediterranean covered by this volume the summers are hot and dry, with 40 hardly any cloud. The winters are mild, and most of the rain, which is scanty along the African coast, falls in that season. Gales are not uncommon from December to March. Visibility is generally good at sea, but on the coast dust haze and radiation fogs occur at times.

- Pressure.**—In winter the Azores anticyclone lies to the west, and 45 a westward extension of the Asiatic anticyclone to the north-east. Depressions (*see* standard article on Lows, page xxxvi) move eastwards across the region rather frequently at this season. Many of these originate in the north-western part of the Mediterranean, and a few near to the Balearic islands or over Algeria; they mostly move rather 50 slowly, taking two or three days to travel from Malta to Cyprus, and frequently remain stationary for a day or two near Cyprus.

In spring the Asiatic anticyclone gradually disappears and pressure

becomes rather low over northern India, Persia and southern Arabia. Depressions continue to move eastwards across the region covered by this Pilot, but become less frequent and less intense as the season advances, and follow slightly more southerly tracks, a few centres passing south of the southern shore of the Mediterranean. At this time of the year the south-easterly winds in front of depressions are very hot and dry; they are called the "ghibli" in Libya, the "kham-sin" in Egypt, and the "scirocco" in Israel, Syria and Lebanon.

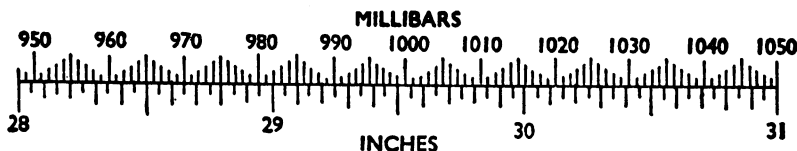
In summer the distribution of pressure is rather stable, mean pressure being low over India, Persia and Arabia, and high around the Azores, so that pressure nearly always decreases from west to east across the region. Although there are very few depressions, a weak disturbance occasionally reaches the western part of the region from Algeria.

In autumn there is a gradual return to the pressure distribution of winter, with a corresponding increase in the number and intensity of depressions, whose tracks after September are similar to those of winter depressions.

A regular diurnal variation of pressure with a range of about 2 millibars is perceptible in settled weather, pressure being highest at about 1000 and 2200 and lowest at about 0400 and 1600 local time.

Monthly mean pressure is highest (1016-1018 mb.) in December and January. West of about *Long. 20° E.* it is lowest (1012-1014 mb.) in April and May, but in about *Long. 25° E.* and further east is lowest in July and August, when it averages about 1010 mb. at Alexandria and 1006-1007 mb. around Cyprus and on the Syrian coast.

The accompanying diagram shows the equivalent of millibars in inches and vice versa.



Wind.—*Twenty miles or more from the coast.* From December to February, there is no clearly predominant wind in any part of the region, the direction being most often in the south-west, north-west, or north-east quadrants. In March, west of about *Long. 25° E.*, all wind directions are about equally frequent, but farther east winds in the NW. quadrant are distinctly the most common. This latter feature extends to the whole region in April, and becomes increasingly noticeable as spring advances. From June to September, 60 to 70 per cent. of all winds are from between west and north. In October and November the predominant winds east of about *Long. 25° E.* are northerly rather than north-westerly, 50 to 70 per cent. of all winds being from between north-west and north-east; farther to the west all directions are about equally frequent in those months. The season with north-westerly or northerly winds therefore lasts for 9 months over the eastern part of the region, but only 6 months in the west.

In the summer the wind is generally light or moderate, but in late September and October the frequency of stronger winds increases. From November to April gales are not uncommon. From December to March the number of days per month on which the wind reaches Beaufort force 7 or more averages about 4 to 6 except between Israel

and Cyprus, where the number is only two or three (*see* Fig. 1). In this latter region gales are nearly always from between south-west and north-west, since the tracks of most of the more intense depressions lie farther north. Elsewhere they may be from any direction.

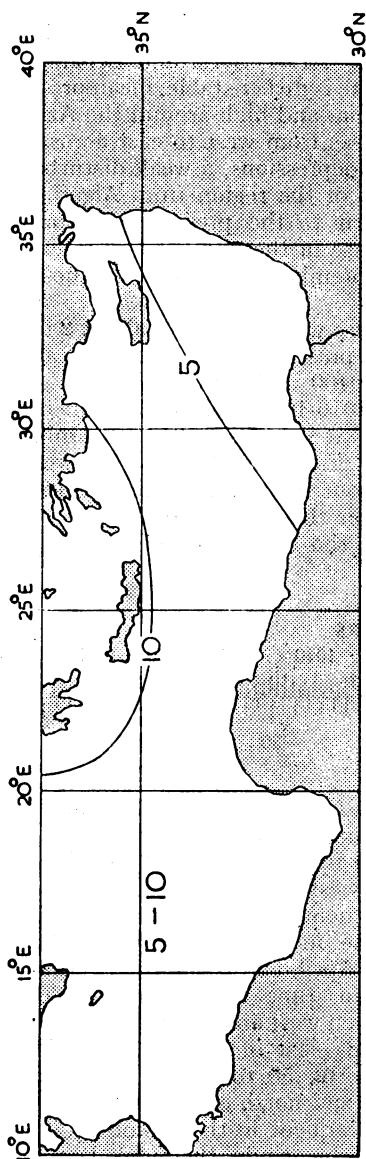


Fig. 1. PERCENTAGE FREQUENCY OF GALES (BEAUFORT FORCE 7 OR ABOVE)—JANUARY

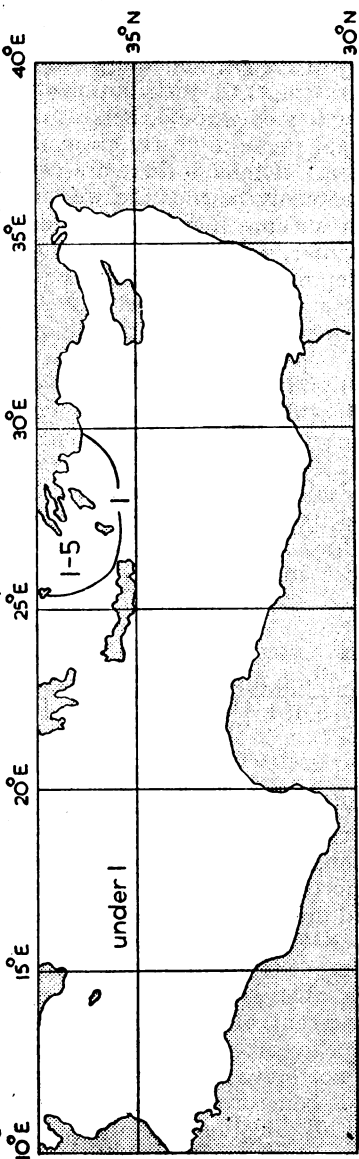


Fig. 2. PERCENTAGE FREQUENCY OF GALES (BEAUFORT FORCE 7 OR ABOVE)—JULY

5 During the whole period from May to September the wind is estimated to reach force 7, or more, on an average, on only about two or three days. *See* Fig. 2.

Local coastal winds.—Libya.—In the winter the winds are rather variable on the coast as they are at sea, due to the passage of depressions. At Tripoli, winds are mostly from directions between

*Table for converting percentage frequency of gales
to gale days per month.*

For the area covered by the chart, the table gives the average number of gale days per month corresponding to any given percentage frequency. For example, along the 20 contour, 12 gale days a month, on an average, may be expected.

Percentage frequency of gales	1	3	5	10	15	20
Average number of gale days per month	1	2	3½	6½	9	12
Percentage frequency of gales	25	30	35	40	45	50
Average number of gale days per month	14	16	18	20	21	23

south-west and north-west, south-westerly winds being the most frequent in the morning and westerly winds in the afternoon: south-easterly winds are more frequent than they are at sea. Eastward of Tripoli (*Lat. 32° 54' N., Long. 13° 11' E.*) it is probable that as far as the eastern shore of the Gulf of Sidra, or Sirte, the directions are rather variable with a predominance of those between south-west and north-west, and that south-easterly winds become somewhat more frequent than at Tripoli. At Bengàsi (Benghazi) the winds are variable, though in the early morning south-easterly are the most frequent; north-easterly and easterly winds are infrequent. At Derna and Tòbruch (Tobruk) the winds are mostly from directions between south-west and north-west; at Derna northerly winds are moderately frequent; at both these places winds from between north-east and south-east are very few.

There is a considerable change in the winds in spring, especially after March during which the weather is often variable and windy; in April the land and sea breezes become prominent. At Tripoli (*Lat. 32° 54' N., Long. 13° 11' E.*) winds from north-east and east increase while westerly and south-westerly winds are fewer than in winter. At Bengàsi the sea breeze from north-west and north predominates except in the early morning when south-easterly winds are still rather frequent. At Derna and Tòbruch north-westerly winds predominate; northerly winds also are frequent at Derna and winds from between north and east at Tòbruch. At this time of the year hot winds from the interior known as "ghibli" occur (*see page 24*).

In the summer the winds are mainly north-easterly on the western part of the coast of Libya and north-westerly on the eastern part. Rās Aamer, about 100 miles north-eastward of Bengàsi, is said to divide the winds, which are north-easterly westward of it and north-westerly eastward of it. At Tripoli the winds are mainly from north-east, veering towards east-north-east during the afternoon; a land breeze from somewhat southward of east blows in the early morning. At Bengàsi (*Lat. 32° 07' N., Long. 20° 03' E.*) northerly winds predominate, being north-north-east in the early morning, somewhat west of north in the early afternoon, and veering towards north during the afternoon. At Derna and Tòbruch north-westerly winds predominate. Winds from off the sea continue to prevail during the first half of the autumn, but in November the weather becomes more unsettled and the winds are more variable, as they are in winter.

Along the western part of the coast of Libya, north-westerly and westerly gales are experienced occasionally at exposed points; they occur in the rear of depressions the centres of which, as a rule, move eastward from northward of Malta. The weather accompanying them is said to be usually fine and cold. These gales are stated to be rare except during the period November to March.

Along the eastern part of the coast northerly gales seldom blow as far south as the head of the Gulf of Sidra, but they cause heavy surf on its low sandy shore. The coast from Bengàsi eastward to the Gulf of Bomba (*Lat.* $32^{\circ} 25' N.$, *Long.* $23^{\circ} 15' E.$) is said to be liable to strong winds which occur very suddenly with little warning from the barometer. There is sometimes a heavy swell on the preceding day from the direction of the wind; but the rough sea quickly subsides when the wind drops. The strong winds are associated with depressions whose centres are situated at a considerable distance northward, e.g., winter depressions passing over Greece; when the track of the depressions is nearer to the African coast, the ordinary well-marked characteristics of the cold front (*see* standard article on Lows, page xxxvi) may be expected.

Strong winds from north-east and east are sometimes experienced; they do not often reach gale force although they do so occasionally.

From January to March, the Gulf of Sidra is liable to sudden hard squalls from north-east, which are known as "gharra." These are associated with thunderstorms and heavy rain; they are much feared by local shipping.

Egypt.—As elsewhere the winds on this coast are rather variable in winter. Land and sea breezes are not marked in the midwinter months, though they are felt in settled weather; the sea breeze becomes prominent in the spring, as is indicated by the increase of winds from northerly directions.

In the spring hot and dry winds from southward to south-east occur at times (*see* "khamsin," page 24). On the western part of the coast, at Sidi Barrani (*Lat.* $31^{\circ} 37' N.$, *Long.* $25^{\circ} 55' E.$), data are only available for 0800; at this hour in winter, though all directions are recorded, south-westerly and westerly winds predominate; easterly and south-easterly winds are the least frequent in winter, but they increase somewhat in spring. At Mersa Matrûh, in January, the winds vary between south and north through west, westerly winds being the most frequent; in spring the northerly winds increase and in April winds from between north-west and north-east prevail. Data for Alexandria and Port Said are given on pages 33–34. At El 'Arish, in the extreme east, winds from between south and west prevail in January; in the spring northerly winds increase in number and in April the winds vary between south-west and north-east through west and north; south-west and north-west are the most frequent.

In the summer the winds on the coast are predominantly north-westerly or north-north-westerly. At Sidi Barrani, at 0800, the winds blow from between west and north with north-west the most frequent directions; at Mersa Matrûh the winds are north-westerly and northerly; at Alexandria the prevailing direction is north-north-west and is very steady; at Port Said the prevailing winds are north-westerly and northerly, but north-east in the afternoon; at El 'Arish (*Lat.* $31^{\circ} 07' N.$, *Long.* $33^{\circ} 48' E.$), in July, the winds vary between south-west and north through north-west. On much of the open coast of Egypt the sea breeze reinforces the prevailing winds (from north-west and north) due to the pressure gradient; hence there is an increase of wind speed during the day and in the afternoon the wind is often fresh, and is occasionally strong. The land breeze, which is much weaker than the sea breeze, is blowing against the wind due to the prevailing pressure gradient, thus it is not as a rule felt; the result is sometimes the production of calms in the early morning, but more usually a weakening of the prevailing north-westerly wind. At

Alexandria (*Lat. 31° 12' N., Long. 29° 53' E.*) the wind speed is at its lowest about an hour after sunrise, and at its highest about 1500 ; the daily range during the period from June to August is about 5 knots. In the autumn the north-westerly winds steadily decrease, but the northerly sea breezes remain prominent during the day. 5

The gale season is in general from October to May, gales being most frequent between December and February ; they blow mainly from between south-west and north-west, and occur with depressions.

The southerly gales are of two types, the first being due to depressions over the sea near the southern shore of the Mediterranean, 10 and the second to the depressions which approach through Libya or develop locally in Egypt. The former occur chiefly in winter, and are most frequent in February. The depressions to which they are due usually take two or three days to travel from Malta or the southern part of the Adriatic. Meanwhile the wind changes to south, gradually 15 increases and veers to south-west, from which quarter the gale sets in. It seldom continues for more than 24 hours, and then veers more or less sharply to west, or to between west and north-west, sometimes accompanied by rain. The rain may be heavy on the coast, but does not extend far inland. Frequently, however, there is no rain. At 20 Port Said (*Lat. 31° 16' N., Long. 32° 19' E.*) the south-westerly gales being offshore cause no sea ; when, however, they shift to north-west a heavy sea is raised. The second type occurs chiefly from March to May, and very occasionally in June. These gales are preceded by light south-easterly or southerly winds, which gradually increase. The 25 depressions are shallow and relatively local, so that the winds of gale force are usually short-lived. The winds of the khamsin type are characteristically dry and dusty, and are very hot in the later months. The wind may continue strong for a short time or decrease to fresh after veering towards west or north-west. 30

The westerly and north-westerly gales are the strongest and most frequent gales on this coast. As previously mentioned, they usually succeed strong winds from south-west. In the western part their duration is short, as a rule not exceeding 24 hours ; in the eastern part it is greater and may last for two or three days when the depressions 35 halt near Cyprus. Wind speeds of over 50 knots are very rare, but occur occasionally. The highest instantaneous speed recorded at Alexandria is 65 knots. At Mersa Matrûh the water is said to bank up in the harbour at the approach of strong winds from north-west.

Wind records at Salûm, the western frontier port of Egypt, show 40 that 16 gales, during which a wind speed of not less than 30 knots was maintained for at least an hour, occurred per year on the average during the five years 1932-6. Nine of them occurred in February, March and April, while the period from August to November was free of them. The highest speed recorded was 66 knots. 45

There is a falling-off in the frequency of strong winds along the coast eastward of Port Said, though squalls descend from the mountains of Sinai at times.

Turkey.—Information for the coast of Turkey is scanty. In winter southerly winds are said to be the most frequent in Rhodes channel. 50 According to data covering two years only, the prevailing winter wind at Tarsus is north-easterly, especially in December, and probably also in January ; but usually winds from south-west begin to increase in frequency in January, and the increase continues throughout February. At Antalya (Adalia) (*Lat. 36° 53' N., Long. 30° 47' E.*) the winds are 55 normally light, and there are frequent calms. There is a distinct

diurnal variation due to land and sea breezes. The maximum number of calms occurs in the afternoon, owing to the opposition of the sea breeze to the prevailing pressure gradient for light northerly winds. At other points on this coast the principal winds are said to be easterly and south-easterly. The direction of these light seasonal winds varies considerably according to local topography. Gales occur from time to time, chiefly from north-east and south-west, the former being much the more frequent. The south-westerly winds increase in spring, but they are still interrupted from time to time by northerly and north-easterly winds. In summer, sea breezes from between south-east and south-west prevail during the day, and light northerly land breezes at night. At this time of the year the north-easterly winds are rare and of short duration; they are accompanied by excessive heat.

Cyprus.—Data for Limassol (*Lat.* 34° 41' N., *Long.* 33° 03' E.) and Kyrenia are given on pages 35-36.

Land and sea breezes are fairly regular on the coast during the warm part of the year. The sea breeze blows from about 1100, or sometimes and in some places as early as 0800 if it is going to be strong, until about 1800 when it falls calm; the land breeze sets in about 0100 and continues until sunrise. The sea breeze often raises enough sea in the afternoon to make boat work uncomfortable; occasionally it reaches force 5 or 6. On the north and south coasts the sea breeze blows from a westerly direction along the coast, the trend of which it follows to become south-west or south-south-west at places such as Larnaca. In Famagusta bay the sea breeze starts from south-eastward and veers during the day.

From April to September the wind direction at Famagusta is south-east from 0900 to 1400 and from then onwards for the rest of the day south-west, with the wind strongest from 1600 to 1700.

Gales are rather frequent during the winter half of the year, when two or three a month are recorded at Famagusta. They occur mainly from between north and east and from south-westward; gales from south-eastward are said not to last long, but to veer to south-west. The northerly gales bring very low temperatures and are sometimes referred to as "tramontana." South-westerly gales are preceded by southerly winds which gradually increase as the depression approaches, and they usually last for two or three days when the depression is retarded over the region southward of Asia Minor. They are said to end from south-west, and not to be followed by winds of gale force from west or north-west. The sea which they raise is heavy owing to their long fetch, and an unpleasant swell reaches some places, e.g., Larnaca, which are sheltered from the gales themselves.

At Famagusta (*Lat.* 35° 07' N., *Long.* 33° 57' E.), strong east-north-easterly gales occur in October, December, January and March, and often last three days, with a heavy sea. At the time of these gales the barometer is usually very high.

Syria, Lebanon, and Israel.—In the neighbourhood of Iskenderon the winds are usually light in the early part of the winter (December) and calms are frequent, but there are liable to be interruptions by squally weather with northerly gales.

From the middle of February onwards, southerly and south-easterly winds gradually increase, with occasional spells of strong south-westerly winds which may reach gale force in Iskenderon körfezi but are not felt in Iskenderon limanı. In April the winds are variable and light and calm; but conditions are liable to be squally, and strong easterly gales, known as "raghiehs," blow for short periods from the

mountains, followed by strong westerly winds. The wind speed depends greatly on the local topography and varies a good deal from place to place. These easterly gales are felt also off the coast near Antioch (*Lat. 36° 12' N., Long. 36° 09' E.*). Light south-westerly winds, and land and sea breezes, prevail in May, and throughout the summer until the middle of September ; during the autumn the winds are variable and light. 5

Data for Beirut and Haifa are given on pages 37-38.

In the Bay of Acre the sea breeze springs up at about 1000 and rapidly attains considerable force, being usually at its strongest between 1300 and 1400. At about 1600 it dies away rapidly and it is usually calm by about 1830. During the strength of the breeze sufficient sea rises to make boat work uncomfortable, though, with care, not dangerous. 10

At about 2200 the land breeze springs up, but blows only very gently until about 0600, when calm again ensues, and it remains calm, except for an occasional very light puff of wind, until the sea breeze sets in. 15

At Jaffa (*Lat. 32° 03' N., Long. 34° 45' E.*) southerly and south-easterly winds are the most frequent in winter, and south-westerly and westerly in spring and summer. In autumn south-west is the prevailing wind ; at this time of the year calms are frequent. 20

At Gaza, apart from frequent calms in winter, the prevailing wind is south-westerly or westerly ; winds from eastward are also fairly frequent. In spring the westerly winds increase and are the prevailing winds during the summer months. In August the westerly winds begin to decrease and the easterly winds to increase, and in September and October the westerly and easterly winds are about equally frequent. In November the winter south-westerly winds re-appear, but they are not so frequent as the westerly and easterly winds. 25 30

The gale season on the coast of Israel begins in November. Gales are most frequent in January and February, and are rare in summer. Their annual frequency is about two, and their direction mostly between south and west ; though on the northern part of the coast they also occur from between north and east, and, exceptionally, from north-westward. The preceding winds set in from south eastward, and sometimes blow strongly from this direction accompanied by thunderstorms and rain. As a rule, however, the wind veers south-westward, meanwhile increasing to gale force with heavy rain squalls. From this direction it may blow hard for one, or even two, days. The cases in which the wind subsequently veers to west and north-west, remaining strong, are rare but important, for anchorages on this coast are exposed to north-westerly winds. The gales are usually succeeded by easterly or north-easterly breezes which may blow fresh for a day or so. Similar depressions to those which produce south-westerly gales in the south may cause easterly and north-easterly gales farther north. These, however, in Israel are not usually so persistent or strong as the south-westerly gales, because depressions in the south as a rule move steadily eastward without a halt, and weaken in crossing the coast. In places along the coast, for example at Rās esh Shuka (*Lat. 34° 19' N., Long. 35° 40' E.*) there are marked eddies during these winds, so that the wind direction may be south-west southward of the cape and north-east northward of it. 35 40 45 50

Farther northward, on the coasts of Syria and Lebanon, gales from between south and west are still experienced, but they decline in number, and gales from between north and east are most frequent. 55

For the most northern parts, the annual number of gales of force 8 from all directions is probably about six compared with about two in the south.

In the neighbourhood of Beirut the north-easterly gales are depression winds like those of Israel. Farther north in Iskenderon körfezi during the winter northerly and north-easterly gales somewhat resemble the bora of the Adriatic and Ægean; they often set in suddenly, and are intensified by cold air from the high land of Asia Minor; they may at times last two or three days. Although they blow home into Iskenderon limanı, owing to the short fetch from the northern part of Iskenderon körfezi, they do not cause a very heavy sea, but they raise a surf on the beach which prevents landing. It is said that a good sign of the approach of a northerly gale is a collection of fleecy clouds over the Plain of Issus, and that the disappearance of these clouds indicates a cessation of the wind. These gales usually commence at sunrise or sunset, and lull about noon, and also just after sunset, when landing is usually possible. There are also local short-lived gales and squalls which, while violent on limited lengths of the coast, do not extend far out to sea. Such are the "raghiehs," the strong easterly gales of Iskenderon. Local intensifications of the north-easterly gales occur also off the mouths of such valleys as that of the Orontes near Antioch (*Lat. 36° 12' N., Long. 36° 09' E.*). These offshore gales do not raise much sea near the coast.

Ghibli.—The "ghibli" of Libya is the dry, hot, and at times dusty wind originating over the desert. The wind direction is usually from south to south-east, but is probably west of south occasionally. When south to south-east winds have not the special dry, warm character, as often happens in winter, the name "ghibli" is not applied to them.

The ghibli is always due to depressions moving eastward through, or just north of, Libya; it is usually accompanied by overcast sky. The dustiness varies at different times, and from place to place. Sometimes the wind is the continuation of inland "simooms" or violent dust storms; on these occasions the atmosphere is very oppressive, while the air is full of fine dust which penetrates everywhere, obscures the sun with a leaden pall, and may reduce the visibility sufficiently to prevent ships entering the port of Tripoli (*Lat. 32° 54' N., Long. 13° 11' E.*). At other times the wind is only light or moderate, and there is nothing worse than summer haze. Ghibli accompanied by dust is much more common in Tripoli than in northern Cyrenaica, where cultivation is relatively widespread. Off the coast of Cyrenaica, a considerable sea runs while the wind lasts, dying down quickly when the wind drops. According to general account, the months specially liable to the ghibli are those of spring and autumn, but in individual years the ghibli may be frequent in summer and late winter. The duration of the wind may be anything from a few hours to five days. The winds are often spoken of as specially violent, but by "violent" in the warm seasons at Tripoli is usually implied something under 30 knots. Speeds of over 50 knots have, however, been reported at Bengàsi.

Khamsin.—This name is generally understood to apply to dry, dusty and mostly hot, southerly winds in Egypt, similar to the dry scirocco farther east. Such winds are, on the average, specially prevalent during the 50 days following the Coptic Easter Monday; hence the name, which is an Arabic word meaning "fifty."

Khamsin winds blow in front of depressions moving eastward over the Mediterranean or through the northern part of Africa, and the

name is frequently applied both to the depressions themselves and to the characteristic weather which accompanies them. In winter similar depressions may be accompanied by cold southerly winds, which sometimes bring weather that would otherwise be characterised as of the khamsin type, i.e., dry, dusty and hazy—but these depressions are not usually classified as the true khamsin. 5

The conditions which favour the occurrence of the khamsin are a depression approaching the Levant from westward while pressure is high eastward of the Nile and over the Red Sea. The first indication is a falling barometer as the depression approaches, a rapid decrease of humidity at night as dry air begins to arrive from southward and the appearance of high, light cirrus clouds. The advance of a depression over the sea from the central Mediterranean is fairly easily foreseen. A depression over the desert is more difficult to locate as little information is available from the Sahara westward of Siwa; 15 hence the depression frequently arrives quickly after the first indications have appeared.

The presence of an easterly wind at Siwa (*Lat. 29° 10' N., Long. 25° 25' E.*) is almost invariably a sign of the approach of a khamsin. The wind occasionally reaches gale force, but may remain only moderate. In February the air may be cool, but later in the season it is excessively hot, oppressive and dry, often with rapid fluctuations of relative humidity. At the stage when the wind becomes southerly and increases, violent dust storms frequently occur. These occasionally reduce the visibility to under 50 yards. The conditions culminating in these extremes may last for two or three days. The wind then veers abruptly towards north-west; there is a rapid fall of temperature, and increase of relative humidity; and almost always the dust clears, although the wind may continue strong. The high cloud decreases and is replaced by broken cumulus, and the weather becomes fresher with, occasionally, light showers. It is often stated that the khamsin begins shortly after sunrise, is strongest in the early afternoon, and ceases towards evening. This is not an invariable rule, but there is a distinct diurnal variation of wind speed, the maximum being in the early afternoon. 35

The average number of warm khamsin depressions is about three a month from February to April, two in May and one in June. Khamsin conditions do not usually last more than a day in February, but depressions move along more southerly tracks as the season advances, and the duration of individual spells consequently increases to three or four days. Spells of five days or more are uncommon. A wind speed of 54 knots has been recorded. 40

Scirocco.—The scirocco of Sinai, Israel, Syria, and Lebanon, is similar, and of similar origin, to the khamsin.

In Sinai the scirocco is a south-easterly wind. Its temperature is raised additionally some 7° by descent from the high land of the interior. The times of year at which it is stated chiefly to occur are from April to May at the end of the rainy season, and in the autumn before the renewal of the rain. The characteristics of the wind are similar to those of the khamsin. Temperatures occasionally reach very high values, the air is very dry and there is much dust. There is a marked diurnal variation, especially on the coast where frequently the scirocco sets in about 0700 (local time), reaches its greatest force about 1100, and gives place by evening to a sea breeze. In the early morning, before the wind sets in, the atmosphere is exceptionally clear. 55

In Israel, Syria, and Lebanon, the stifling, dry, dust-laden scirocco

wind, known in its intense form as "simoom" or "samun," is between south-east and east, and originates from the Arabian desert. Although the accompanying clouds of dust or sand are heavy and may limit visibility to a few yards, they are as a rule shallow, and the amount of sand transported is not great. The periods during which the scirocco is specially frequent in this region are from April to May or early June, and from September to November inclusive. The duration of scirocco conditions is similar to that of the khamsin. The early rains of winter are often preceded by a long spell of this type of scirocco, the wind gradually veering to west.

In this region strong and very dry, dusty winds blow from easterly directions at times during the winter, as well as during the spring and autumn. They are extremely cold, and are known as the "cold scirocco," the name "scirocco" being here associated specially with the dry dustiness, and not with the high temperature or the exact wind direction. These winter winds occur with almost cloudless skies, and are specially cold when their direction is a few degrees northward of east.

Cloud.—The amount of cloud is small. In winter the sky is on average 5- to 6-tenths clouded, and in summer only 1- to 2-tenths clouded.

Rainfall.—Rainfall is seasonal and nearly all comes in winter. On the African coast, most of it falls with westerly or north-westerly winds, but on the coast of Israel, and farther north, with south-westerly winds. It is much heavier on the coasts of Turkey and Syria than on the North African shore, where it is scanty. At Antalya (Adalia) the annual fall averages about 44 inches (nearly twice that of south-east England) and at Beirut 35 inches. At Haifa (*Lat. 32° 50' N., Long. 34° 59' E.*) it is about 24 inches, and on the coast of Cyprus 18 to 22 inches, but at Tripoli it is only 15 inches and decreases eastwards to 7 inches at Alexandria and 3 inches at Port Said.

Most of the rain falls from October to March, January and December being the wettest months. At Antalya the average in January is 11 inches, at Beirut and Haifa over 7 inches, and in Cyprus between 4 and 5 inches. Much of the rain is associated with the cold fronts of depressions (*see* standard article on Lows, page xxxvi) which are often accompanied by thunderstorms. In general rainfall is heavier than in south-east England, but does not last so long. Sometimes, however, when a depression becomes stationary near Cyprus, rain may fall for several days in succession between Cyprus and Egypt.

The average number of days per month with appreciable rain (0.04 inches or more) from December to February, at Beirut and Antalya (Adalia) (*Lat. 36° 53' N., Long. 30° 47' E.*), is as high as 12 to 16, but over most of the region is 6 to 10, and at Port Said 2 to 4. Of these days about one-sixth are days of considerable rain (0.40 inches or more) in the wettest months on the coast of Israel and farther north, but elsewhere the proportion is smaller and there are few such days on the Egyptian coast.

At Alexandria 11 inches of rain are said to have fallen on December 9, 1888, on an occasion of thunderstorms with waterspouts in the vicinity. Such a catastrophic downpour is quite exceptional, and even a fall of 4 inches in 24 hours is very rare in all parts of the region covered by this Pilot.

In the dry season, from June to September, there is often no rain in any part of the region, and there is generally none in these months on the coasts of Egypt and Israel.

As is often the case in regions not far from great deserts, the rainfall of this region, especially that of the Egyptian coast, varies greatly from year to year, and average figures are not therefore a good indication of what may be expected in a particular year. At Alexandria, for example, between 1931 and 1940, the annual fall varied from a little over an inch to 10 inches.

There are thunderstorms, on an average, on 2 to 5 days per month from October to March at Antalya and Beirut (*Lat. 33° 54' N., Long. 35° 30' E.*), but at most places on the coasts of Africa, Israel, and Cyprus the number is only 1 to 2; thunderstorms are sometimes accompanied by hail in winter and early spring.

Snow usually falls in winter on the coastal ranges above 4,000 feet (1,219^m2), but very rarely at sea level, even in the north.

Fog and visibility.—At sea visibility is mainly good, especially eastward of about *Long. 25° E.*, but there are generally several days in the year with fog between April and August.

On the coast radiation fog sometimes develops in the early morning when the wind is very light, but normally disperses soon after sunrise. Such fogs are in general more common in winter than in summer, but even in winter do not normally develop more often than once in a month.

On the coast of Libya visibility is often interfered with by dust haze during the spring and summer, and when the wind known as the "ghibli" (*see page 24*) is strongly developed this often gives the equivalent of fog, and the dust may be carried a hundred miles or more seaward. Further to the east visibility is similarly reduced by dust when the "khamsin" (*see page 24*) is blowing.

Sandstorms incidental to the eastward passage of a depression across the eastern Mediterranean sometimes reduce visibility to such an extent as to interfere seriously with shipping. For example, on March 2, 1937, visibility was thus reduced in the middle of the day along the whole coast from Salûm to Alexandria, being less than 50 yards at both places.

Exceptions to the general rule that early morning mists or fogs are most frequent in winter are to be found on the coasts of Cyprus and the coastal plains of Turkey, where morning mists are not uncommon in summer but are rare in winter, and also on the coast of Israel, where early morning fogs develop most often between April and October.

The daily variation of visibility near Adana (*Lat. 37° 00' N., Long. 35° 19' E.*) in summer, the time of calms, light airs, and land and sea breezes, is of a special type. Smoke and dust render the surface layer over the plains very hazy in the evening. With the setting in of the night wind from the mountains, the haze is usually carried out to sea.

Along the southern coast of Turkey there is a decided change of visibility from summer to autumn. The change usually occurs in September, in which month, although there is no change of wind, the haze which is so common from June to August usually disperses.

Temperature and humidity.—In August mean air temperature is about 80° F. on the African coast, and two or three degrees higher on the coast of Israel and farther north. In January it is generally between 53° and 57°.

In exceptionally hot weather, from March or April to October, temperature may exceed 100° at times in almost all parts of the region covered by this Pilot. It has been known to reach 103°, even in March, at Alexandria and 104° at Haifa, and in Tripolitania in the

summer has touched 115° at Khoms, also known as Homs (*Lat.* $32^{\circ} 40' N.$, *Long.* $14^{\circ} 17' E.$), and 121° at Zliten (Ziliten).

In winter there have on rare occasions been slight frosts on the coasts of Cyprus and Lebanon, and during one exceptionally cold spell in 5 Cyprus in February temperature fell to 24° at Limassol, but at sea level on the African coast frost is virtually unknown.

Both temperature and humidity are greatly affected by the direction of the wind, temperature more so in summer than in winter, off-shore winds in summer generally being associated with high temperature. 10 In Egypt temperature has been known to fall 30° in two hours at the cessation of the khamsin. Off-shore winds in all seasons are generally dry, especially on the African coast where they are often extremely dry, but since the sea breeze is relatively moist and in most places prevails for a considerable part of the year, mean relative humidity 15 is only moderately low, even on the African coast, and does not vary greatly with the seasons.

As an extreme instance of the great change of humidity resulting from a change of wind direction, a humidity as low as 2 per cent., associated with a khamsin at Alexandria, has been observed to be 20 replaced by humidity of 90 per cent. within two hours, on the arrival of a north-west wind in the rear of a depression.

The temperature of the sea surface (*see* figures 3 to 6) is highest in August and September, when the average ranges from between 76° and 77° west of about *Long.* $15^{\circ} E.$ to between 77° and 78° off the 25 coasts of Egypt and Israel. There is a general fall during the next few months, especially in the west, and by February or March, when the sea surface generally is coldest, the average temperature ranges from about 58° west of *Long.* $15^{\circ} E.$, to about 62° off the coast of Israel. There is in all months an increase of mean temperature from 30 west to east, and this is greatest about May, when it amounts to about 7° .

Between May and December the temperature of the sea is occasionally 4° or 5° above or below the average for the time of year, and from January to April is sometimes 2° or 3° above or below it.

35 **Mirage.**—Mirages, both inferior and superior, are often seen over the eastern Mediterranean (*see* standard article on mirage, page xxxiii). Mirage is frequent off Tripoli (*Lat.* $32^{\circ} 54' N.$, *Long.* $13^{\circ} 11' E.$) and in the Gulf of Sidra, and near Cyprus on calm summer mornings.

Climatic Tables.

40 The tables that follow give statistics for several land stations at which there is a regularly reporting weather station. The figures given are averages, percentage frequencies, or extremes, as stated; it must be realised that these values refer to the actual positions in which the weather has been observed and *not* necessarily to the open 45 sea or to the approaches to ports in the vicinity. The tables for land stations should therefore be consulted with discretion, especially as regards wind, visibility, cloud, temperature and humidity, since all these elements are probably affected, sometimes a great deal, by local conditions. The following notes indicate ways in which conditions 50 in the open sea may be different from those at the nearest reporting station for which a table is published.

(1) Temperatures over the sea are less extreme, or show smaller departures from the mean, than those over the land. In the night and early part of the day, it is usually warmer over the sea than at 55 a land station, but in the afternoon it is generally cooler over the sea.

(2) Since rainfall at most of the coastal stations in this region is partly orographic, the figures given are not representative of rainfall at sea in the vicinity. In general, rainfall is smaller at sea than on the coast, especially on the coasts of Syria, Lebanon, Turkey and Cyprus.

(3) Cloud amount is only broadly representative of the state of the 5

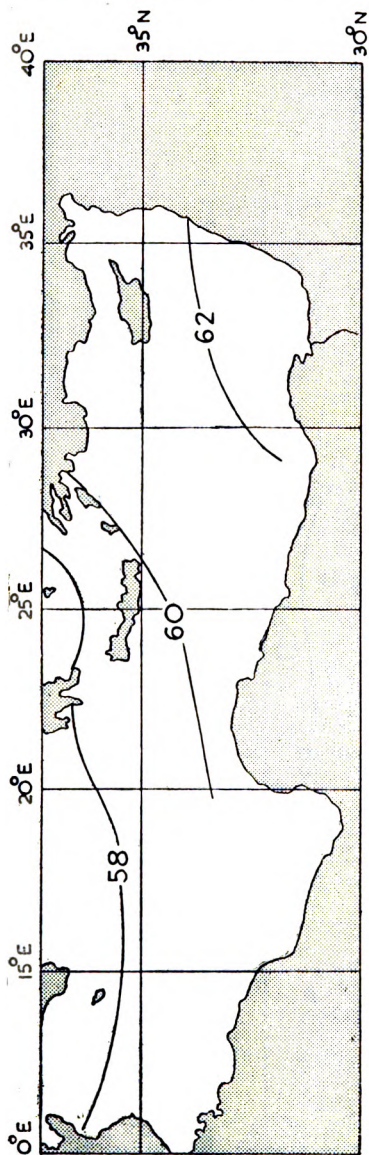


Fig. 3. MEAN SEA SURFACE TEMPERATURE — FEBRUARY

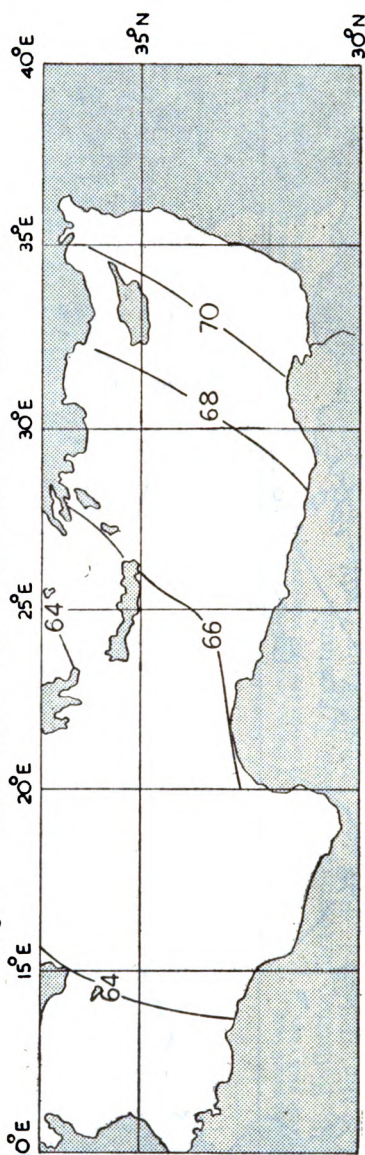


Fig. 4. MEAN SEA SURFACE TEMPERATURE — MAY

sky at sea. There is a tendency for the amount to be less at sea than on the coast during the day, but to be slightly greater at sea than on the coast at night.

(4) Wind speed is nearly always greater at sea than on the coast, and there may be twice the number of gales at sea than are experienced 10 at a shore station unless it is exceptionally well exposed on, for

example, a headland or small low-lying island. Off the African coast, however, in those months when north-westerly or northerly winds prevail over the open sea, the wind is generally stronger on the coast than at sea during the warmest part of the day, although much lighter on the coast than at sea during the night. (Wind direction is affected

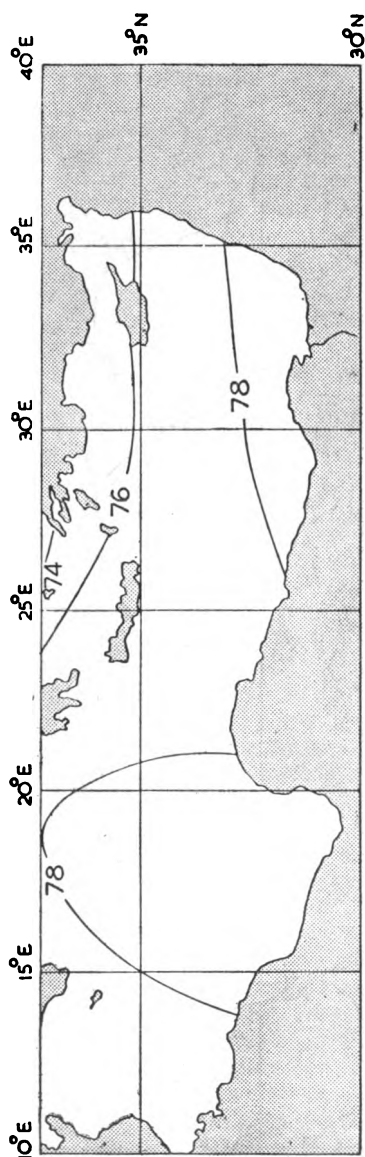


Fig. 5. MEAN SEA SURFACE TEMPERATURE—AUGUST

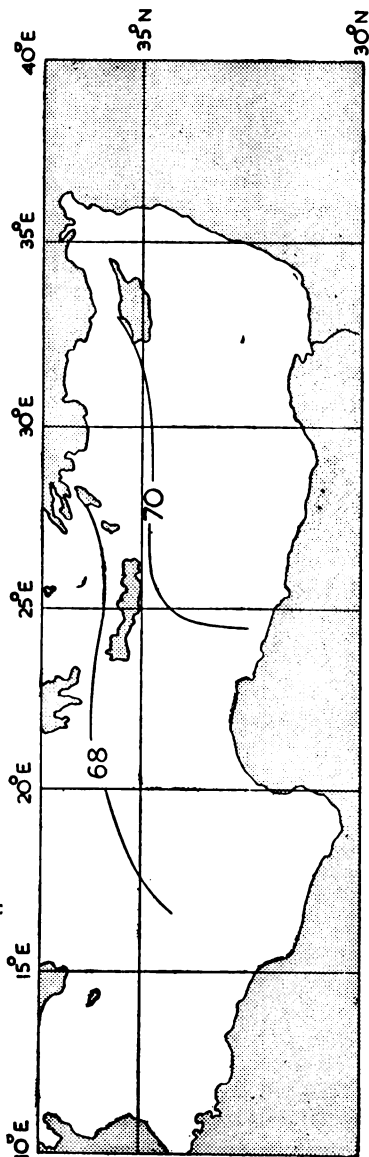


Fig. 6. MEAN SEA SURFACE TEMPERATURE—NOVEMBER

as explained under "Local modification of the weather near the coast," page xlviii.)

(5) The figures for fog or poor visibility at inland stations or sheltered harbours are no guide to conditions at sea and in the approaches to ports (see "Fog," page 27). On occasions when there is fog on the coast, better visibility will nearly always be found at sea.

PLACE—BENGASI. LAT. 32° 06' N., LONG. 20° 04' E. Height above Mean Sea Level, 82 feet.
Climatic Table compiled from 5 to 46 Years' Observations, 1886 to 1936.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE Mean of		Relative humidity	SKY No. of days	RAIN No. of days with Average fall	WIND DIRECTION												Mean wind speed	No. of days with wind of 34 knots or more	No. of days with fog or mist														
		Daily max.	Daily min.				Percentage of observations from						Percentage of observations from																						
							0900						1500																						
							N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.				SE.	S.	SW.	W.	NW.	Calm								
January	63	50	69	42	5	7	16	11	3	in.	6	3	6	3	10	10	10	7	16	10	11	9	2	12	10	17	12	95	2	8	10	0.1			
February	1016	64	51	74	42	5	7	16	11	3	1	5	9	9	28	11	10	10	7	16	6	19	5	8	11	11	16	32	2	11	13	0.3			
March	1015	69	54	86	44	7	7	4	0	3	11	15	8	8	23	11	10	8	7	16	8	21	17	9	11	10	13	28	3	12	13	0.9			
April	1014	74	58	94	48	4	5	3	0	2	14	20	10	4	33	11	8	5	7	23	10	23	19	0	7	4	16	18	3	11	13	0.6			
May	1013	79	63	100	53	11	6	2	0	0	11	25	18	7	43	10	4	3	6	23	6	33	26	0	2	4	8	8	1	11	13	0.6			
June	1014	83	68	101	56	16	4	0	0	0	14	25	22	10	47	10	4	3	6	23	6	34	26	0	3	4	8	3	1	10	12	0.4			
July	1013	84	71	93	65	21	0	0	0	0	46	20	1	1	46	17	1	3	6	21	9	57	9	0	1	0	1	1	2	27	3	6	12	0	
August	1014	85	72	92	67	21	0	0	0	0	46	20	0	1	46	17	1	3	6	17	8	44	17	0	0	0	1	4	32	1	6	11	0.1		
September	1016	83	69	96	62	55	6	0	2	1	27	19	6	5	21	17	5	5	6	19	8	48	13	1	3	4	11	16	33	1	7	10	0.1		
October	1017	80	66	92	57	49	5	1	2	0	9	9	5	24	21	8	4	5	6	8	13	22	11	2	13	9	12	13	23	2	9	10	0.3		
November	1017	74	60	85	51	5	5	1	5	5	12	9	36	10	4	5	8	11	4	5	8	11	15	11	2	10	12	13	23	2	10	11	0.3		
December	1017	66	53	75	45	6	6	2	6	10	3	5	34	17	8	8	14	6	8	14	6	7	9	1	10	12	16	20	22	3	10	11	0.5		
Means	1015	75	61	104*	41**	—	55	—	—	—	18	13	4	19	9	6	6	6	6	17	8	25	13	1	6	5	9	11	28	2	9	11	—	—	
Totals	—	—	—	—	—	—	131	40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. observations	19-20	46	17	37††	7	46	8	7	7	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	8	8	—

PLACE—ALEXANDRIA. LAT. 31° 12' N., LONG. 29° 53' E. Height above Mean Sea Level, 105 feet.
Climatic Table compiled from 5 to 62 Years' Observations.

MONTH	PRES- SURE at M.S.L. Mean (8+14+20)	AIR TEMPERATURE at Mean of			Relative humidity	SKY No. of days	RAIN No. of days with 0.04 in. or more	WIND DIRECTION										Mean wind speed	No. of days with wind of 27 knots or more	No. of days with visibility less than 1 nautical mile												
		Highest in each month		Lowest in each month				0800					1400																			
		Daily max.	Daily min.					Percentage of observations from					Percentage of observations from																			
		Daily max.	Daily min.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm											
		Daily max.	Daily min.	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm											
January	mb. 1017	° F. 66	° F. 51	° F. 73	% 56	12	in. 0.9	9	4	7	11	18	20	8	11	15	11	6	6	4	20	22	18	2	knots 9	1	—	—	—	2		
February	1018	65	52	73	58	19	0.9	13	5	11	16	12	9	6	14	6	17	22	4	3	12	27	20	1	10	1	—	—	—	1		
March	1016	70	55	86	49	8	0.4	13	3	11	16	8	6	14	6	17	22	4	3	5	20	21	1	8	13	1	—	—	—	1		
April	1014	74	59	95	53	21	0.1	18	1	10	17	8	6	19	7	18	29	4	4	1	2	16	27	1	8	12	0	—	—	—	1	
May	1014	79	64	98	59	21	0.1	14	1	10	17	6	4	10	14	9	28	36	3	2	2	10	19	0	7	12	0	—	—	—	1	
June	1012	83	69	97	63	21	0.1	23	1	8	16	5	4	11	33	7	28	20	1	0	0	2	8	40	1	7	12	0	—	—	1	
July	1010	85	73	91	70	27	0.0	20	4	0	0	1	5	19	49	2	22	8	0	0	0	3	15	57	0	6	11	0	—	—	1	
August	1010	87	74	91	71	27	0.0	29	7	0	1	1	5	16	36	5	28	7	0	0	0	4	9	52	0	6	11	0	—	—	1	
September	1014	86	73	94	68	27	0.0	33	15	1	3	4	3	6	24	11	34	16	1	1	0	0	7	41	1	6	11	0	—	—	2	
October	1016	83	68	92	62	22	0.2	18	25	5	10	8	3	2	10	19	30	37	6	3	2	7	10	18	3	7	10	0	—	—	3	
November	1017	77	62	86	54	16	1.3	4	12	18	9	13	10	6	4	6	22	18	33	6	5	7	15	23	14	5	7	11	0-2	—	5	
December	1018	69	55	78	47	18	2.2	8	5	8	12	16	15	7	8	21	10	14	5	7	7	15	23	14	5	7	11	0-2	—	—	2	
Means	1015	77	63	103*	43**	—	—	—	17	12	5	10	8	9	20	11	21	20	3	3	2	6	15	29	1	7	12	—	—	—	34	
Totals	—	—	—	—	—	65	7-1	30	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	45	45	45	45	45	5	62	62	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Standard of time—30° E. meridian

* Mean of highest each year.

** Mean of lowest each year.

† Highest recorded temperature.
‡ Lowest recorded temperature.

Authorities :—MS. data supplied by Meteorological Department, Cairo.
Cairo Physical Department, Meteorological Report.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—PORT SAID. LAT. 31° 16' N., LONG. 32° 19' E. Height above Mean Sea Level, 13 feet.
Climatic Table compiled from 5 to 60 Years' Observations.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE Mean of				Relative humidity		SKY No. of days		RAIN		WIND DIRECTION								Mean wind speed 8+4+0	No. of days with 27 knots or more	No. of days with visibility less than 1 nautical mile																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
		Daily max.	Daily min.	Highest in each month	Lowest in each month	0800	1400	Clear, 8/10 or less	Cloudy, 7/10 or more	Average fall	No. of days with 0.04 in. or more	Percentage of observations from																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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Standard of time—30° E. meridian.

† Highest recorded temperature.
†† Lowest recorded temperature.

* Mean of highest each year.
** Mean of lowest each year.

Authorities :—MS. data supplied by Meteorological Department, Cairo.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—LIMASSOL. LAT. 34° 41' N., LONG. 33° 03' E. Height above Mean Sea Level, 55 feet.
Climatic Table compiled from 6 to 22 Years' Observations, 1913 to 1934.

MONTH	PRES- SURE at M.S.L. Mean	AIR TEMPERATURE Mean of			Relative humidity	SKY No. of days		RAIN		WIND DIRECTION										Mean wind force or speed	No. of days with wind force 8 or more	No. of days with fog or mist	
		Daily max.	Daily min.	Highest in each month		Lowest in each month	Clear, less than 2/10	Cloudy, more than 8/10	Average fall	No. of days with 0.04 in. or more	Percentage of observations from												
											†(8+14)												
											N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	0960	2100		
January . . .	mb. 1016	° F. 62	° F. 44	° F. 69	% 70	15	2	4.2	10	in. 3.3	5	17	16	9	4	4	16	8	21	1.2	1.2	0.4	
February . . .	1015	62	43	69	77	13	1	3.3	8	3.3	4	6	11	9	7	6	27	13	20	1.1	1.0	0.4	
March . . .	1014	68	46	78	72	17	0.9	1.7	9	3.3	3	4	11	9	7	9	23	10	19	1.5	1.0	0	
April . . .	1012	73	49	84	66	22	0.8	0.9	3	0.9	2	2	5	10	6	8	33	11	12	1.4	1.1	0.4	
May . . .	1012	80	55	92	62	24	0.4	0.5	0.5	0.5	2	2	3	13	11	10	43	9	7	1.2	0.9	0.1	
June . . .	1009	87	62	98	55	27	0	0.2	0.5	0.2	2	2	3	11	10	14	41	8	7	1.2	0.7	0	
July . . .	1006	92	65	99	59	30	0	0	0.1	0	1	1	5	9	11	15	33	7	11	1.0	0.6	0	
August . . .	1007	92	66	100	60	30	0	0	0.1	0	1	2	5	8	15	37	6	15	9	0.9	0.6	0	
September . . .	1011	89	63	97	58	28	0	0.1	0.7	0.1	1	3	6	11	8	17	30	6	18	0.8	0.6	0	
October . . .	1015	83	59	92	53	24	0.2	1	3	1.1	1	7	7	8	13	24	8	29	0.8	0.7	0		
November . . .	1016	75	54	84	44	70	61	1.9	6	6	7	7	7	8	7	11	19	12	23	1.1	1.2	0	
December . . .	1017	66	48	72	39	68	12	4.6	9	4.6	6	14	17	11	5	5	13	11	13	1.4	1.4	0.5	
Means . . .	1013	77	55	103*	68	—	—	—	—	—	3	5	8	10	8	11	29	9	17	1.1	0.9	1	
Totals . . .	—	—	—	—	—	256	9	18.5	48	—	—	—	—	—	—	—	—	—	—	—	—	—	
Extreme values . . .	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
No. of years' observations . . .	21	22	22	22	22	10	10	22	10	22	6								10	10	10		

Standard of time—90° E. meridian.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature.
†† Lowest recorded temperature.

Authorities :—MS. data supplied by Physical Department, Cairo.
Cairo Physical Department, Climatological Normals for Egypt and the Sudan, Cyprus and Palestine, 1938.

METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—KYRENIA. LAT. 35° 21' N., LONG. 33° 19' E. Height above Mean Sea Level, 45 feet.
Climatic Table compiled from 10 to 28 Years' Observations, 1888 to 1934.

MONTH	PRES- SURE at M.S.L. Mean of day.	AIR TEMPERATURE Mean of		Relative humidity	SKY No. of days	RAIN No. of days with 0.04 in. or more	WIND DIRECTION												Mean wind force		No. of days with force 8 or more	No. of days with fog or mist †				
		Daily max.	Daily min.				0900						2100						0900	2100						
							Percentage of observations from						Percentage of observations from													
				° F.	° F.	%	Clear less than 2/10	Average fall	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm
January	mb.	61	46	74	5	in.	19	23	7	17	29	2	1	2	0	28	12	2	4	10	13	0	31	0	1.3	0.1
February	1017	62	46	72	9	4.6	23	29	3	17	17	2	0	3	0	27	14	1	4	11	11	0	31	0	1.3	0.1
March	1015	67	48	70	9	4.3	18	30	4	16	19	8	2	4	0	25	7	0	4	12	14	3	36	0	1.3	0.0
April	1012	73	52	67	9	1.8	21	39	2	19	13	8	2	9	0	26	2	0	2	9	14	3	44	0	1.2	0.0
May	1012	80	59	65	13	0.7	21	39	1	5	11	7	1	15	0	22	2	0	0	7	18	1	49	0	1.1	1.2
June	1009	87	66	67	23	0.2	23	46	1	5	11	7	2	7	0	20	2	0	0	12	23	2	41	0	1.2	0.0
July	1006	93	70	60	29	0	25	49	1	5	7	3	3	7	0	20	0	0	0	10	27	3	39	0	1.0	1.1
August	1007	83	71	58	29	0.0	25	51	2	4	7	3	1	8	0	19	0	0	0	11	27	4	44	0	1.1	0.1
September	1011	89	67	57	28	0.0	27	48	2	2	9	3	2	7	0	25	0	0	0	8	12	2	53	0	1.2	1.1
October	1015	82	62	67	20	0.2	31	41	4	5	17	7	1	6	0	28	0	0	0	11	10	4	47	0	1.1	0.0
November	1016	74	55	72	10	2.5	17	34	6	16	18	4	2	3	0	23	6	0	1	13	17	3	37	0	1.3	1.2
December	1017	65	50	72	6	5.4	14	31	3	23	22	5	0	2	0	19	9	0	4	13	16	1	38	0	1.4	1.3
Means	1013	77	58	103° 35**	14	—	21	39	3	10	15	5	1	6	0	23	5	0	2	11	15	3	41	0	1.2	1.2
Totals	—	—	—	—	—	21.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	28	28	28	10	10	28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	10

Standard of time—30° E. meridian.

* Mean of highest each year.
** Mean of lowest each year.

† Highest recorded temperature.
†† Lowest recorded temperature.

Authorities:—MS. data in M.O.

Cairo Physical Department Climatological Normals for Egypt and the Sudan, Cyprus and Palestine, 1938.
METEOROLOGICAL OFFICE,
AIR MINISTRY.

PLACE—HAIFA. LAT. 32° 48' N., LONG. 34° 59' E. Height above Mean Sea Level, 33 feet.

Climatic Table compiled from 5 to 59 Years' Observations, 1898 to 1949.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE			Relative humidity	SKY		RAIN	WIND DIRECTION																		Mean wind force s	No. of days with wind of force 8 or more Beaufort Scale	No. of days with fog or mist																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Standard of time—30° E. meridian.

† Highest recorded temperature in 40 years. ‡ Data refer to Mt. Carmel, height 974 feet above M.S.L.

‡ Lowest recorded temperature in 30 years.

* Mean of highest each year.
** Mean of lowest each year.

Authorities :—MS. data supplied by State of Israel Meteorological Service, Hakirya.

METEOROLOGICAL OFFICE,
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PLACE—BEIRUT. LAT. 33° 54' N., LONG. 35° 28' E. Height above Mean Sea Level, 111 feet.
Climatic Table compiled from 30 to 72 Years' Observations, 1875 to 1948.

MONTH	PRES- SURE at M.S.L.	AIR TEMPERATURE		Relative humidity	SKY No. of days	RAIN		WIND DIRECTION												Mean wind force	No. of days with force 7 or more	No. of days with fog or mist								
		Daily max.	Daily min.			Highest in each month	Lowest in each month	Average fall	No. of days with 0.01 in. or more	Percentage of observations from						Percentage of observations from														
										N.	N. NE.	E.	SE.	S.	SW.	W.	NW.	Calm	N.	NE.	E.	SE.	S.	SW.	W.	NW.	Calm			
January	mb.	62	51	69	43	7.5	16	2	2	4	8	9	14	19	5	3	36	9	6	3	1	13	32	12	5	19	12	1.7	1	
February	1016	63	51	73	44	6.2	14	2	2	4	7	8	13	24	7	2	34	8	6	4	2	11	36	12	7	14	1.4	1.7	0.6	
March	1015	66	54	80	46	5.4	11	5	5	4	6	6	10	26	8	3	32	13	8	2	2	9	33	11	7	15	1.2	1.7	0.4	
April	1013	72	58	86	51	4.6	9	6	4	2	2	2	11	32	12	5	24	10	8	3	2	9	34	14	8	12	1.3	1.7	0.2	
May	1013	78	64	91	57	3.4	6	5	4	2	1	1	9	41	12	6	20	11	8	2	0	7	39	13	7	13	1.4	1.6	0.1	
June	1011	83	69	90	64	2.6	3	5	4	2	1	1	51	12	4	14	6	8	3	0	0	8	52	16	8	7	1.6	1.8	0.1	
July	1007	87	73	91	69	1.8	2	1	1	0	2	1	59	9	5	17	3	1	0	0	0	6	60	20	6	5	1.7	1.9	0.1	
August	1008	89	74	92	71	1.4	1	1	1	0	1	7	59	9	5	17	3	1	0	0	0	4	53	22	11	7	1.4	1.8	0	
September	1012	86	73	90	68	2.1	4	4	6	2	4	8	30	12	7	29	10	9	1	1	4	29	20	19	15	13	1.1	1.7	0.2	
October	1016	81	69	88	62	3.5	15	1	8	4	4	8	22	7	3	36	17	11	3	1	3	23	14	15	10	18	1.0	1.6	0.1	
November	1017	73	61	82	53	6.7	10	4	6	3	8	11	16	4	3	47	13	13	3	2	7	25	9	10	18	0.9	1.5	0.6		
December	1018	66	55	74	46	7.3	13	3	4	4	12	15	19	3	2	38	8	9	3	3	12	28	9	7	22	1.2	1.6	1		
Means	1014	75	63	95*	40**	72	13	3	4	3	5	11	33	9	4	28	9	7	2	1	8	37	14	9	13	1.3	1.7	—	—	
Totals	—	—	—	—	—	35-0	78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—
Extreme values	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of years' observations	62	62	62	62	35	72	72	35	35	30	30	30	35	35	35	35	35	35	35	35	35	35	35	35	35	35	30	30	30	30

Standard of time—30° E. meridian.

* Mean of highest each year.

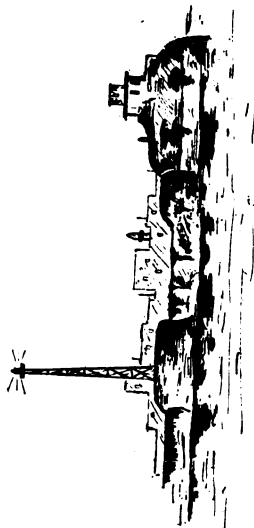
** Mean of lowest each year.

† Highest recorded temperature } in 72 years.
‡ Lowest recorded temperature }

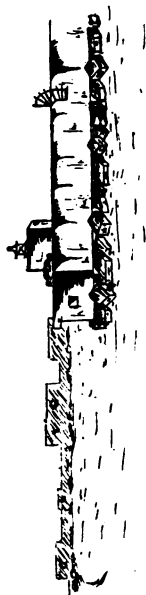
Authorities :—Beirut Monthly Bulletin.

MS. data supplied by American University, Beirut.

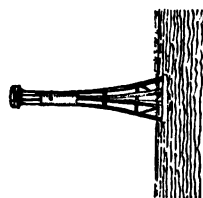
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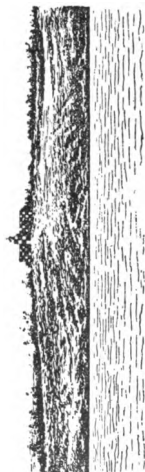
Tripoli (Libya) light-structure (page 44).
(Original dated 1947.)



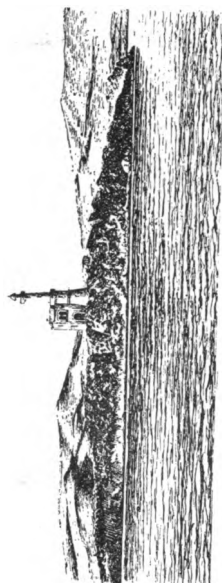
Tripoli (Libya) Molo Principale light-structure (page 44).
(Original dated 1947.)



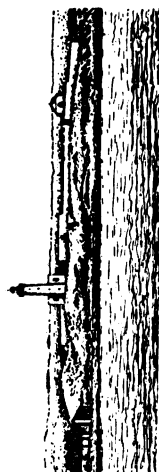
Secca Caliuscia and Râs el-Zur
light-beacons (page 45).
(Original dated 1883.)



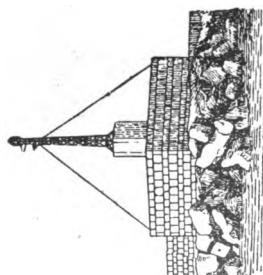
Râs Tagiûra lighthouse (page 49).
(Original dated 1941.)



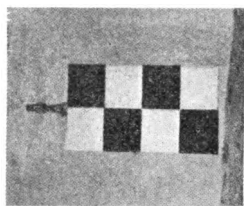
Râs el-Hallab lighthouse (page 50).
(Original dated 1941.)



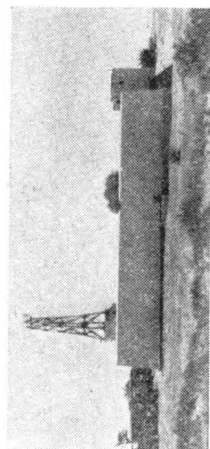
Homs lighthouse (page 52).
(Original dated 1941.)



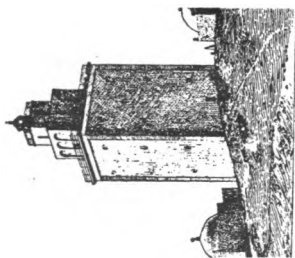
Homs Mole Head light-structure (page 52).
(Original dated 1933.)



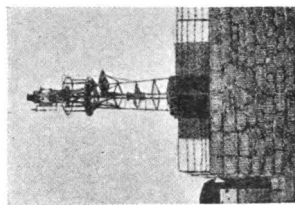
Sirte light-structure (page 58).
(Original dated 1941.)



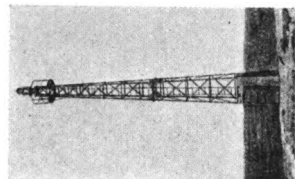
Ez-Zuetina light-structure (page 65).
(Original dated 1946.)



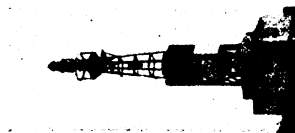
Bengási lighthouse
(page 68).
(Original dated 1936.)



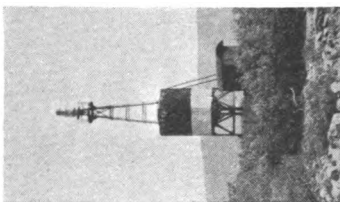
Tolemaide light-structure
(page 73).
(Original dated 1936.)



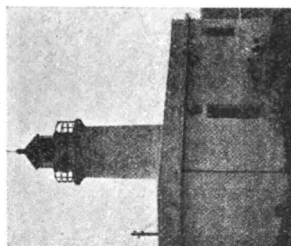
Rás Aamer light-structure
(page 74).
(Original dated 1933.)



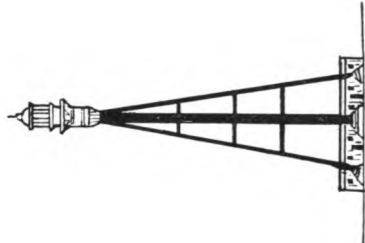
Apollonia light-structure
(page 75).
(Original dated 1933.)



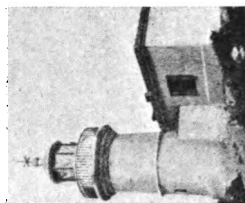
Ras el-Hilal light-structure
(page 75).
(Original dated 1947.)



Derna lighthouse
(page 77).
(Original dated 1933.)



Rosetta, Damietta and
Brulos light-structures
(pages 116, 117, 119).



Hypsili lighthouse
(page 142).
(Original dated 1941.)

CHAPTER II

COAST OF LIBYA

CLIMATE AND WEATHER.—See page 16 *et seq.*

Charts 249, 3353.

COAST.—Beacons.—Rās Agedir (Ashdir) (*Lat. 33° 10' N., Long. 11° 34' E.*), the boundary between Tunis and the Libyan province of Tripolitania, is low and inconspicuous. It is marked by a white masonry beacon, surmounted by an ovoid, 52 feet (15^m8) high, situated close to a group of trees, and is difficult at times to distinguish. This beacon, bearing 191°, leads to an anchorage for small craft with local knowledge.

An iron framework beacon, surmounted by a red cone, 11 feet (3^m4) in height, stands about 3 miles northward of Rās Agedir beacon, and a similar beacon, but surmounted by a black cylinder, 15 feet (4^m6) high, stands about 6 cables south-south-eastward of the red cone beacon.

The coast westward of Rās Agedir is described in *Mediterranean Pilot*, Vol. 1.

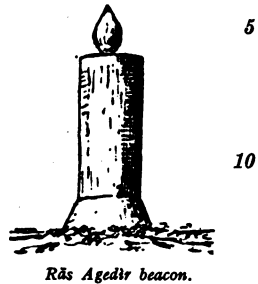
There are several shoals, with depths of from 4½ to 5 fathoms (8^m2 to 9^m1), lying about 12 miles north-north-eastward of Rās Agedir, and depths of less than 10 fathoms (18^m3) extend nearly 15 miles northward of the cape.

From Rās Agedir to Sidi Said, about 16 miles east-south-eastward, the coast is very low, sandy, and bordered by lagoons. See view facing page 40.

Sidi Said, a hill, 82 feet (25^m0) high, is situated near the south-eastern end of a low, narrow peninsula, known as *Peninsula el-Māchbez* (Ras el Makhabez). Two prominent marabouts, consisting of two white buildings close together, each with a cupola, stand on the summit of Sidi Said.

Peninsula el Māchbez extends west-north-westward from the coast, and its western extremity is named Rās el Talga (*Lat. 33° 07' N., Long. 11° 42' E.*).

A prominent one-storey building, with a rectangular tower at its western end, painted with black and white bands, stands on the *Peninsula el Māchbez*, about 2½ miles east-south-eastward of Rās el-



Charts 2158b, 449.

Charts 249, 3353.

Talga. Close to this building is a grey barrack with a flagstaff which, at a distance, has the appearance of a small fort. About half a mile westward of this latter building there is a prominent solitary tree.

- 5 On the mainland, about $4\frac{1}{2}$ miles west-south-westward of Rās el-Talga, there is a steep yellowish bluff, about 24 feet (7^m3) high, on the summit of which stands a beacon, consisting of a dark-coloured wooden pyramid, 24 feet (7^m3) high, known as Marset el Briga. See view facing this page.

- 10 **Bu Chemmāsc bay** (Bu Kemmask).—**Buoyage**.—Bu Chemmāsc bay, which is entered through a narrow channel close westward of Rās el-Talga, extends east-south-eastward between the Peninsola el-Māchbez and the mainland. The anchorage near the head of the bay, known as Marsa Focui (Fokui), is only available for small craft with
15 local knowledge.

- The entrance channel, in which there is a least depth of 5 feet (1^m5) in the fairway, but with depths of from one to 2 feet (0^m3 to 0^m6) on either side, is difficult to distinguish at a distance. Formerly the channel was marked by stakes and two buoys but, in 1945, it was
20 reported that most of the stakes were missing and that the buoys had been removed. In clear weather, however, even without these marks, the channel is easy to follow between the lighter coloured shoals on either side.

- A light-buoy, exhibiting a *white flashing* light, giving a short flash
25 *every three seconds*, is moored about three-quarters of a mile northward of Rās el Talga.

With westerly winds a strong current sets into the channel and raises the water level in the bay ; with easterly winds the reverse is the case.

- On the southern side of the bay are the ruins of the old Turkish fort
30 of Bu Chemmāsc (Bu Kemesh) (*Lat. $33^\circ 05' N.$, Long. $11^\circ 44' E.$*) which consist of a high wall, partially demolished, with a small square pillar at its eastern extremity, and a mole, alongside which fishing craft can lie. At a distance, particularly in the morning, when approaching from the eastward, it has the appearance of an imposing castle with
35 large twin towers.

A low white building adjoins Fort Bu Chemmāsc and close southward lies the village of Pisida which is a Customs port.

- Off-lying dangers**.—Secca Ehdouz (Ehdouz shoal or bank), with a least depth of $1\frac{1}{2}$ fathoms (2^m7) over it, lies about $4\frac{3}{4}$ miles north-
40 north-eastward of Rās el-Talga. Within three-quarters of a mile southward of this shoal there are depths of $2\frac{1}{2}$ and $2\frac{3}{4}$ fathoms (4^m6 and 5^m0).

A shoal, with a depth of $8\frac{3}{4}$ fathoms (16^m0) over it, lies about 22 miles north-north-eastward of Rās el-Talga.

- 45 Several shoal patches, with depths of $2\frac{1}{2}$ to 5 fathoms (4^m6 to 9^m1) over them, lie within 3 miles of the coast between Rās el-Talga and Sidi Said.

A $3\frac{3}{4}$ -fathom (6^m9) patch is situated about 4 miles north-eastward of Sidi Said.

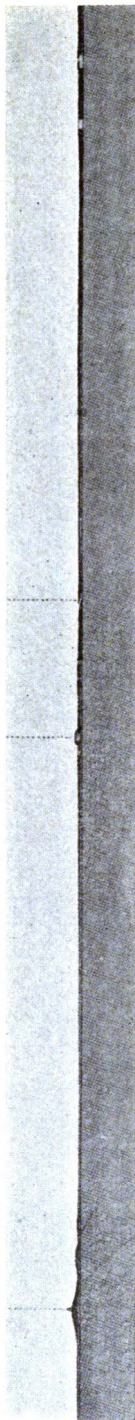
- 50 **Caution**.—The water is very clear in the vicinity of the above-mentioned dangers and the bottom can be seen, in places, at a depth of over 10 fathoms (18^m3). Caution is, however, necessary when approaching the coast and frequent soundings should be taken.

Coast.—In addition to the two prominent marabouts on Sidi Said,

Charts 2158b, 449.

Marset el-Briga.

*Rās Agedir beacon,
bearing 255°,
distant 6 miles.*



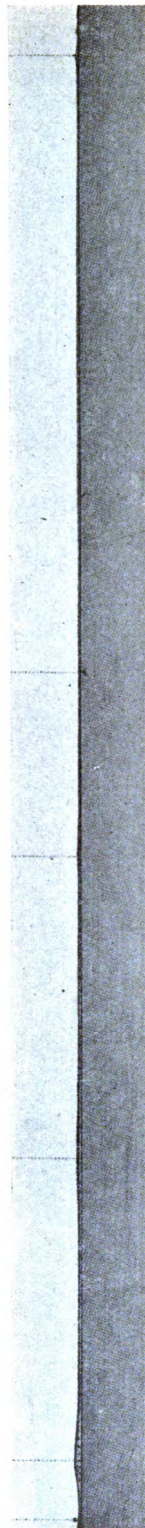
Coast between Rās Agedir and Marset el-Briga from north-eastward.

*Solitary
tree. Pisida.*

Flagstaff.

Light-buoy.

*Marset-el Briga,
bearing 245°,
distant 6½ miles.*



Coast between Marset el-Briga and Pisida from northward.

Sidi Ali.

*Sidi Said,
bearing about 300°,
distant 3 miles.*



Coast between Sidi Said and Sidi Ali from northward.

(Originals dated 1931.)

To face page 41.

Zuara Marina,
bearing about 202°,
distant 5 miles.

Conical dune.

Wind motor. *Minard.* *Wind motors.*



Lighthouse
(non-existent in 1950).

Tunny establishment,
bearing about 202°,
distant 5 miles.

Conical dune.

Lighthouse
(non-existent in 1950).



Zuara Marina.

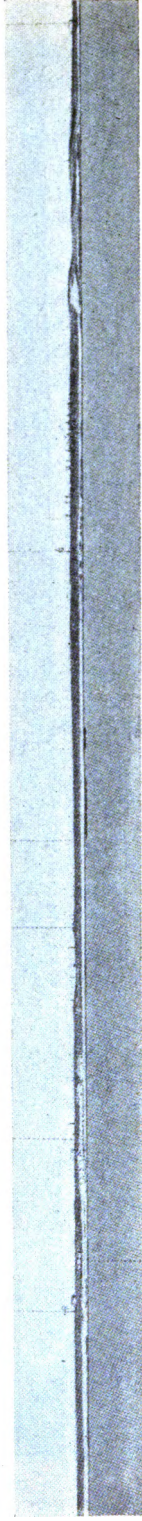
Two views in the vicinity of Zuara anchorage.

Tunny establishment,
bearing about 180°,
distant 3 miles.

Wind motor.

Entrance to anchorage.

Wind motor.



Custom house.

Marsa Zuaga from northward.
(Originals dated 1931.)

Charts 249, 3353.

already mentioned, a circular column in ruins stands on the summit of a nearby hill.

Sidi Ali, a hill, 47 feet (14^m3) high, is situated about 3 miles east-south-eastward of Sidi Said (*Lat. 33° 04' N., Long. 11° 51' E.*). *See* 5 view facing page 40. On its summit there is a square tower close to the ruins of a marabout.

About 2 miles south-south-westward of Sidi Ali is a hill, known as Sidi Zelten (Zultan), on which stands a marabout. This appears as a white patch, but is not visible on all bearings, being hidden by a range of sand dunes.

Chart 3353.

With the exception of the above-mentioned landmarks, the coast between Sidi Said and the town of Zuara, about 13½ miles south-eastward, is low and sandy with a few hillocks and ruined houses.

Zuara may be identified by its palm oasis, which extends along the 20 coast for about 5 miles, and by 3 conspicuous water towers, close to the coast, about 1½ miles north-westward of the harbour.

Chart 3353, plan of Zuara anchorage.

Zuara anchorage.—Shoal.—Zuara anchorage lies about 2 miles south-eastward of the town of Zuara. A shoal, with a depth of less 25 than 3 fathoms (5^m5) over it, extends about 4 cables northward from Rās Gioggig (Jioggig), the eastern extremity of a small peninsula extending from Zuara Marina, a village, situated amongst palm trees close to the coast.

Harbour.—The harbour, on the eastern side of the peninsula 30 mentioned above, affords shelter to small vessels, in depths of from 9 to 11 feet (2^m7 to 3^m4), but is unsafe with east and east-north-easterly winds. A mole extends about 3 cables south-eastward from Rās Gioggig (*Lat. 32° 56' N., Long. 12° 07' E.*), and another extends eastward and thence north-eastward from a position about 3½ cables 35 southward of Rās Gioggig.

The Harbour Master's office, which is conspicuous, is situated on Rās Gioggig.

Anchorage.—Directions.—Anchorage may be obtained in depths 40 of from 3¾ to 5 fathoms (6^m9 to 9^m1), mud, with the head of the northern mole bearing about 213°. A vessel approaching from eastward should give the coast a berth of at least 3 miles on account of the irregular depths off it. Vessels, except those of very light draught, anchor in the roadstead.

Caution.—*See* page 1.

Harbour facilities.—Fresh provisions may be obtained.

There is a hospital at Zuara.

Communications.—Zuara is connected to the general railway, telegraph and telephone systems.

Chart 3353.

Coast.—Between Rās Gioggig and Marsa Zuaga, about 17 miles east-south-eastward, the coast is low with sandy dunes, and about 7½ miles from Zuara is Duna Horma, a conical sandy hillock, from 40 to 50 feet (12^m2 to 15^m2) high. Several rocky shoals, with depths



Sidi Ali marabout.

10

15

45

50

Charts 2158b, 449.

Chart 3353.

of from $2\frac{1}{2}$ to 4 fathoms (4^m6 to 7^m3), lie within $1\frac{1}{2}$ miles of this stretch of coast. Near Marsa Zuaga the coast becomes rocky, high and steep.

- 5 **Tunny fishery.**—Tunny nets may extend as far as $4\frac{1}{2}$ miles from the coast off Marset Mereccàn (Merekkan), situated about $4\frac{1}{2}$ miles south-eastward of Rās Gioggig (*Lat.* $32^\circ 56'$ N., *Long.* $12^\circ 07'$ E.). See page 16.

Chart 3353, plan of Marsa Zuaga.

- 10 **Marsa Zuaga.**—**Dangers.**—Marsa Zuaga is a slight indentation sheltered by a line of shoals and rocks ; it has some importance during the tunny fishing season on account of the tunny cannery situated here. It may be identified by the white buildings of the cannery which have three brick chimneys. See view facing page 41. Another
15 prominent mark is the small white building of the Custom House. Rocks and shoals, some of which are above water, extend west-north-westward for about $1\frac{1}{2}$ miles and from 2 to 4 cables offshore, from a position about 3 cables north-north-eastward of the tunny fishery buildings.

- 20 Small vessels may obtain anchorage, in depths of from $2\frac{3}{4}$ to $4\frac{1}{4}$ fathoms (5^m0 to 7^m8), rock, in Marsa Zuaga.

- Light.**—**Beacons.**—Two beacons which, in line bear 195° , are situated about three-quarters of a mile westward of the tunny fishery buildings, and lead between the shoals fronting the anchorage in a least
25 depth of about 14 feet (4^m3). The rear beacon (*Lat.* $32^\circ 49'$ N., *Long.* $12^\circ 26'$ E.), from which a light is exhibited, at an elevation of 59 feet (18^m0), consists of a white masonry hut with a black band, 17 feet (5^m2) in height, standing about $1\frac{1}{4}$ cables south-south-westward of the front beacon.

- 30 **Communications.**—Zuaga is connected to the general telegraph and telephone systems. The railway station is about half a mile from the village.

Tunny fishery.—Tunny nets are usually laid out every year and extend about 3 miles north-westward from Marsa Zuaga. See page 16.

- 35 **Caution.**—See page 1.

Chart 3353.

- Coast.**—**Tunny fishery.**—Marsa Sabràtha (Sabrata) is a small indentation in the coast about $1\frac{1}{2}$ miles eastward of the tunny fishery buildings at Marsa Zuaga ; it affords shelter to small craft. A ruined
40 amphitheatre on the slope of a hill is a good mark, and near which are some wind-motor sand a white marabout. See view facing this page.

- The buildings of a tunny fishery are situated westward of the amphitheatre. The nets extend about 3 miles in a north-westerly
45 direction from the coast. See page 16.

Anchorage may be obtained by vessels with local knowledge about $2\frac{3}{4}$ cables offshore at Marsa Sabràtha ; the bottom is rocky and uneven, and the anchorage is exposed to winds northward of west or east. See caution on page 1.

- 50 Sabràtha village is situated a short distance from the coast, and is remarkable for its numerous ruins of the ancient town of the same name. It is connected to the general railway, telegraph and telephone systems.

Fresh provisions may be obtained.

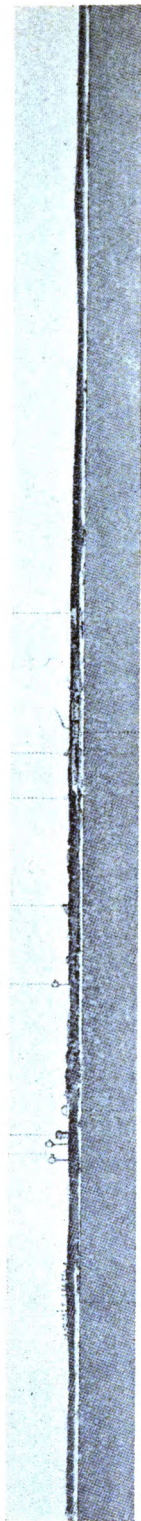
Charts 2158b, 449.

Water tower.

Ruin.

*Wind
motors.*

*White
house.*



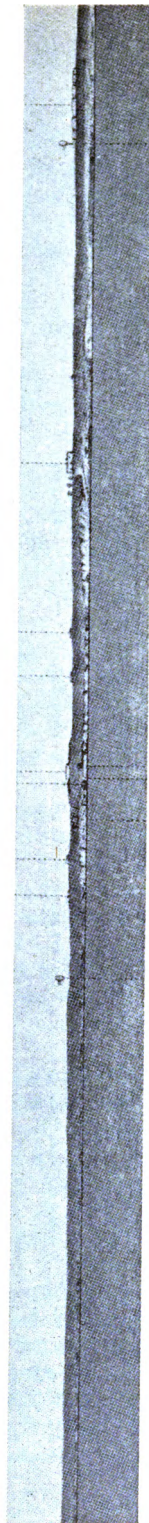
Oasis.

Marabout.

*Tunny establishment,
bearing about 180°,
distant 3 miles.*

Marsa Sàbratha from northward.

Ruined forts.



Wind motor.

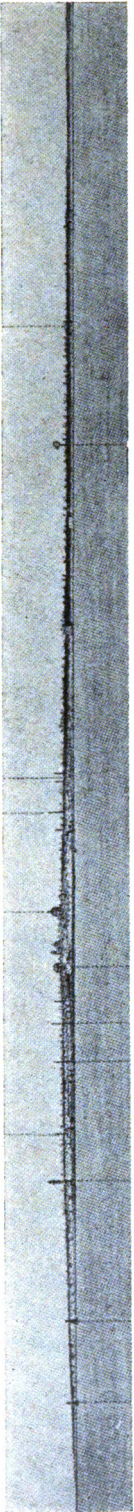
Entrance.

Marsa Dila from northward, distant 2 miles.

(Originals dated 1931.)

Wind motor.

Cathedral.



Light-beacons.

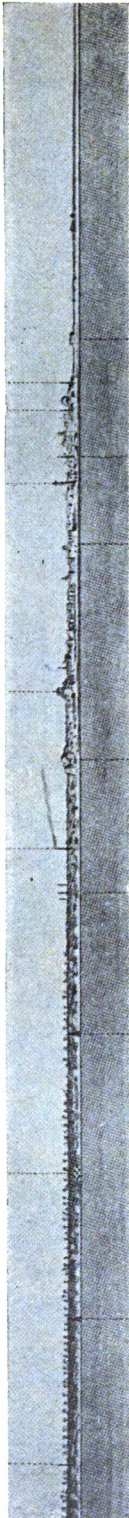
*Old Lighthouse
(now a smaller
structure).*

Tripoli from west-north-westward, distant 6 miles.

*Old lighthouse
(now a smaller
structure).*

Loading marks in line.

Cathedral.



Light-beacons.

*The Castle. Old
Signal Station.*

Tripoli from northward, distant 6 miles.

Cathedral.

Light-beacons.



Chimney.

The Castle.

*Old Lighthouse,
bearing 245° (now a
smaller structure).*

Tripoli from east-north-eastward, distant 6 miles.
(Originals dated 1931.)

Chart 3353.

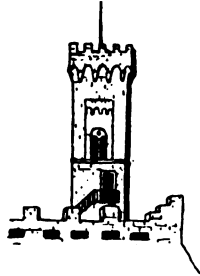
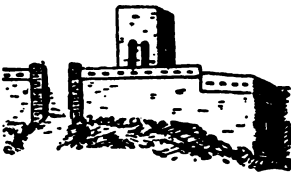
About $4\frac{1}{2}$ miles eastward of Sabràtha (*Lat. 32° 48' N., Long. 12° 30' E.*) is Marsa Sormàn (Sorman), a slight indentation in the coast, thence to Sidi Nasser, $7\frac{1}{2}$ miles eastward, the coast is low, and about a mile farther are some buildings surrounding a wind-motor. 5

Marsa Dila is a slight indentation about 2 miles eastward of Sidi Nasser; on the western side of the narrow entrance is a small circular tower, and on the hills behind are the ruins of five forts. On the shore are several wooden sheds and a flagstaff close westward of them. See view facing page 42. 10

Tunny nets are usually laid out every year northward of Marsa Dila, and may extend as far as $4\frac{1}{2}$ miles from the coast. See page 16.

A conspicuous white house, with a turret and a flagstaff, stands about 3 miles east-south-eastward of Marsa Dila, and a mile inland.

About 5 miles eastward of Marsa Dila is a group of houses, named Bir Suria, and about 6 miles farther eastward is Torre di Sidi Bilâl (Blal) or Calichopulo, standing on a conical hill, about 130 feet (39^m6) high, which is a good mark; close westward of the tower is a framework mast. Sidi Suleiman is a marabout partly in ruins, standing about $2\frac{1}{4}$ miles east-north-eastward of Torre di Sidi Bilâl. The white buildings of the Zanzur tunny fishery with two black chimneys, situated on the beach, about $1\frac{1}{2}$ miles eastward of Sidi Suleiman, are visible from about 6 miles offshore. Tunny nets are laid out every year at Zanzur; see page 40. 15 20 25

*Sidi Bilâl tower.**Fortino di Gargàresc.*

Eastward of Zanzur the coast becomes 30 rugged and is uncultivated; the only conspicuous object is Fortino di Gargàresc (Ker Kareh) with a masonry tower in its centre, situated 5 miles eastward of Sidi Suleiman. About 3 miles east-north-eastward of the fort is Râs Lahmar, from 35 which tunny nets extend about $2\frac{1}{4}$ miles north-north-westward. See page 16.

Charts 248 (Rada di Tripoli), 244 (Porto di Tripoli).

PORTO DI TRIPOLI.—General remarks.—Porto di Tripoli 40 is situated eastward of Râs el-Zur, the point on which the town stands, about $2\frac{1}{4}$ miles eastward of Râs Lahmar (*Lat. 32° 53' N., Long. 13° 08' E.*), and between the land trending eastward from the southern end of the town, and a bank of rocky islets and reefs, known as Secche Râs el-Zur, extending east-north-eastward from Râs el-Zur. See views 45 facing this page.

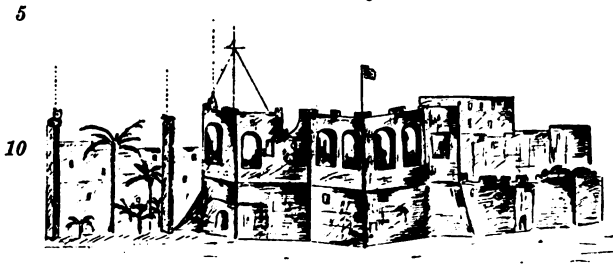
The following objects are conspicuous and easily identified:—The Castle, 150 feet (45^m7) high, which is the oldest building in the old city and has two flagstaffs, situated about $2\frac{1}{4}$ miles east-north-eastward of Râs Lahmar; the belfry of the church of Santa Maria degli Angeli, 133 feet (40^m5) high, about $2\frac{1}{4}$ cables north-westward of the Castle; the Cathedral, with its octagonal dome, 151 feet (46^m0) high, and belfry, 197 feet (60^m0) high, 4 cables south-westward of the Castle, 50

Charts 2158b, 449.

Charts 248 (Rada di Tripoli), 244 (Porto di Tripoli).

and the light-grey square tower of the Uaddan hotel, 123 feet (37^m5) high, situated 3 cables north-eastward of the Cathedral belfry.

The harbour is enclosed by two breakwaters: Molo Principale or



15 The Castle, Tripoli.
(Original dated 1947.)

Spanish mole, the northern one, which stands on Secche Rās el-Zur, extends about one mile east-north-eastward and then curves south-eastward for about a quarter of a mile; Molo Sottoflutto (Ka-

ramanli), the southern one, which has been breached about one cable from its head, extends north-north-westward, for about half a mile, from a position on the southern shore one mile eastward of the Castle.

The harbour entrance lies between the heads of the two breakwaters. In 1950, the navigable width, between the light-buoys marking it, was reduced by sunken wrecks to about 230 feet (70^m1), with a least depth in it of 30 feet (9^m1).

25 **Dangers.—Buoy.**—Secche di Rās el-Zur, already mentioned, extends 1½ miles east-north-eastward of Rās el-Zur; several above-water rocks stand on this reef.

Secche di Caliuscia (Kaliyusha), over which there is a least depth of 1½ fathoms (2^m7), lies north-eastward of Secche di Rās el-Zur, being 30 separated from it by a channel 3 cables wide, with depths of from 30 to 39 feet (9^m1 to 11^m9) in it. The sea breaks over this reef in strong northerly winds.

A shoal, with a least depth of 7 feet (2^m1) over it, extends for a distance of about 1½ cables, in a northerly and easterly direction from the breached head of Molo Sottoflutto (*Lat. 32° 54' N., Long. 13° 12' E.*); there are three detached shoal patches, with depths of from 17 to 18 feet (5^m2 to 5^m5) over them, eastward of it, and depths of less than 4 fathoms (7^m3) extend as far as Middle Shoal buoy, about 2½ cables north-eastward.

40 Patches of foul ground lie about 3½ cables northward and 7½ cables north-north-eastward of the front leading light of the eastern pair (*see* sketch on page 45) and detached patches of foul ground, with depths of from 16 to 18 feet (4^m9 to 5^m5) over them, and on which the sea breaks, lie about 1½ miles east-north-eastward of the harbour entrance 45 between the breakwaters.

There are numerous obstructions, including some above-water wrecks, in the harbour, the positions of which are indicated on the chart.

Lights.—A light is exhibited, at an elevation of 113 feet (34^m4), from a black, steel framework tower, with white horizontal bands, 50 88 feet (26^m8) in height, near the inner end of Molo Principale. *See* view facing page 38.

A light is exhibited, at an elevation of 34 feet (10^m4), from an iron framework structure on a masonry base, 20 feet (6^m1) in height, on the head of Molo Principale. *See* view facing page 38.

Chart 3353.

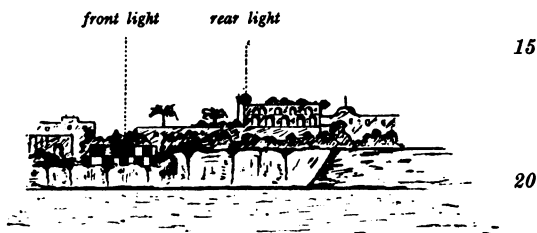
Charts 248 (Rada di Tripoli), 244 (Porto di Tripoli).

A light is exhibited, at an elevation of 49 feet (14^m9), from a black, iron framework beacon, 47 feet (14^m3) in height, situated near the eastern end of Secche di Rās el-Zur (*Lat. 32° 55' N., Long. 13° 12' E.*).

A light is exhibited, at an elevation of 49 feet (14^m9), from a red, iron framework beacon, 47 feet (14^m3) in height, situated near the south-western end of Secche di Caliuscia, one mile north-eastward of the head of Molo Principale. *See view facing page 38.*

Leading lights.—Two pairs of leading lights are exhibited as follows :—

Eastern pair.—The front light, at an elevation of 45 feet (13^m7), from a black and white chequered building, situated about 2½ cables, east-north-eastward of the root of Molo Sottafutto, the rear light at an elevation of 96 feet (29^m3), from an iron column, surmounted by a black and white chequered disc, standing on the roof of the Office del Governo, a large building about three-quarters of a cable southward of the front light. These lights are in line bearing 173° (*see sketch*).



Tripoli. Eastern pair of leading lights.

(Original dated 1947.)

Western pair.—The front light, at an elevation of 42 feet (12^m8), from the north-western corner of the Castle (*see sketch on page 44*), the rear light, at an elevation of 94 feet (28^m6), from the Clock tower, situated about three-quarters of a cable south-westward of the front light. These lights are in line bearing 236°.

Several other lights are exhibited at various heights from the heads of moles and jetties.

Buoyage.—A can buoy, surmounted by a triangle, and known as Middle Shoal buoy, is moored about 2½ cables eastward of the head of Molo Principale.

A conical light-buoy, painted green and exhibiting a *green flashing light every second*, marks the northern side of the entrance between the heads of the breakwaters ; a can light-buoy, painted red and exhibiting a *red flashing light every one-and-a-half seconds*, marks the southern side of the entrance.

A conical buoy, surmounted by a triangle, is moored close southward of the light-buoy marking the southern side of the entrance.

There are numerous mooring buoys in the harbour, the positions of which are indicated on the chart.

Signal station.—The Signal station is situated at the Port Offices, about one cable eastward of the main lighthouse at the inner end of Molo Principale (*Lat. 32° 54' N., Long. 13° 11' E.*).

Pilots.—A pilot will board a vessel, making the customary signal, about one mile outside the Rās el-Zur and Caliuscia light-beacons ; in stormy weather the pilot will not go outside the reefs. Pilotage is compulsory for all steam vessels over 100 tons net register, and for sailing vessels over 200 tons net register.

Currents.—In the offing the current usually sets south-eastward at

Charts 248 (Rada di Tripoli), 244 (Porto di Tripoli).

a rate of from a half to one knot, but occasionally, during the prevailing north-easterly winds in the summer, a current setting in the opposite direction is experienced. A surface current setting across, or through, the harbour entrance is associated with the occurrence of the Marrobbio (page 12); this current may be very strong (rates of over three knots have been observed) causing eddies and tide rips in the vicinity of the harbour entrance. It does not flow in one direction for more than 20 or 30 minutes and then may flow strongly in the reverse direction. The oscillations in tidal level, and in the associated tidal streams, gradually die out.

Marrobbio.—See page 12.

Anchorage. — Directions. — Traffic Signals. — For anchorage outside the harbour, see page 47. The bottom in the harbour is generally soft sand, mud and weed; in the dredged areas the layer over sandstone or dead coral is thin, and the holding quality, poor. In 1950, there were anchorage berths for two vessels of 500 feet (152^m4) length and 24 feet (7^m3) draught, and for two of 350 feet (106^m7) length and 20 feet (6^m1) draught.

A vessel approaching Porto di Tripoli from the westward along the coast should not bring the main lighthouse (*Lat.* 32° 54' N., *Long.* 13° 11' E.) to bear less than 075°, and when about 2 miles from it should steer north-eastward and then eastward until the eastern pair of leading lights are in line, bearing 173°, when she should alter course on to the line and pass between Rās el-Zur and Caliuscia light-beacons.

Vessels are cautioned that these light-beacons do not mark the edge of the reefs; depths of less than 5 fathoms (9^m1) extend about one cable from Rās el-Zur light-beacon, and about 2½ cables from Caliuscia light-beacon, towards the channel. When the western pair of leading lights come in line, bearing 236°, course should be altered on to the line, which leads between the two light-buoys marking the entrance and into the harbour. Care should be taken to keep north-westward of a line joining the Ceremonial jetty, extending eastward from the Castle, and the can light-buoy, marking the southern side of the harbour entrance.

A vessel approaching from the eastward should, until abreast of Rās Tagiūra (Tajura), keep at least 3 miles offshore, and steer for the main lighthouse, on the inner end of Molo Principale, when it bears 220°. When the eastern pair of leading lights come in line, bearing 173°, steer for them on that bearing and follow the directions previously given.

The passage into the port should not be attempted in bad weather, and entry is prohibited when a red flag or pendant is displayed from the blockship on the southern side of the harbour entrance.

The following traffic signals are displayed from the afore-mentioned blockship:—

<i>Signal.</i>	<i>Meaning.</i>
A black cone	Port open for incoming traffic.
Two black cones, bases together	Port open for outgoing traffic.
Three black balls, disposed vertically, 6 feet apart .	Port closed.
A red flag or pendant	Entry prohibited, due to bad weather.

Mist or haze is rather common, especially with winds between east and south, and a vessel should approach the coast with caution.

Chart 3353.

Charts 248 (Rada di Tripoli), 244 (Porto di Tripoli).

Prohibited anchorage.—Anchorage is prohibited, on account of submarine cables *outside* an area, indicated by pecked lines on chart 248, extending about $1\frac{1}{2}$ miles northward of a line joining the light-structure on the south-western end of Secche di Caliuscia and Bush- 5
beila, or French fort (*Lat. 32° 54' N., Long. 13° 10' E.*), about $2\frac{1}{4}$ miles south-westward.

Dangerous area.—A dangerous area, indicated by pecked lines on chart 248, lies close northward of the eastern end of Secche di Caliuscia.

Cautionary areas.—Owing to the existence of submarine cables, 10
vessels are warned not to anchor eastward of a line joining Caliuscia light-beacon to a point close north-eastward of the root of Molo Sottoflutto, or westward of a line extending 022° from Bushbeila. These limits are indicated by pecked lines on the charts.

Regulations.—Port Signals.—Bills of health and port clearances 15
are compulsory and can be obtained from the Port Office.

The following sound signals, on the whistle or siren, should be used by a vessel at anchor, or alongside, to attract attention :—

<i>Signal.</i>	<i>Meaning.</i>	
A succession of short blasts	Fire alarm.	20
Letter P (· — — ·) in the Morse code	Police wanted.	
Letter W (· — —) in the Morse code	Doctor wanted.	
One long blast	Lighters wanted.	
Two long blasts	Floating crane wanted.	
Three long blasts	Pilot wanted.	25
Four long blasts	Tug wanted.	

The following are extracts from the harbour regulations :—

A vessel secured alongside a quay is forbidden to lay out hawsers to the warping buoys, moored parallel to it, except when necessary for shifting or for additional security in bad weather. 30

Ratguards must be fitted on all mooring ropes and wires ; they can be supplied on hire by the Port Manager.

It is prohibited to throw overboard in the harbour any lighted material, ashes or rubbish. An ash barge is available on application to the Harbour Master. 35

A vessel with explosive or inflammable material on board should discharge it into lighters at the Calata Caneva quay at the inner end of Molo Sottoflutto (*Lat. 32° 54' N., Long. 13° 12' E.*).

Vessels which burn fuel oil should pump out their bilges before entering harbour. Every precaution must be taken to avoid fuel oil 40
escaping into the harbour. Permission must be obtained from the Harbour Master before embarking fuel oil.

Chart 244.

Quays and jetties.—Banchina Cagni or Spanish quay, about 1,300 feet (396^m2) long, lies at the inner end of Molo Principale ; in 45
1950, vessels with draughts of 14 or 23 feet (4^m3 or 7^m0) could berth alongside, held off by single or double pontoons. At the south-western corner of the quay is a masonry jetty, about 230 feet (70^m1) long, known as Repair jetty, at which vessels of 16 feet (4^m9) draught can berth ; there is a depth of only 10 feet (3^m0) off the southern corner of 50
this jetty.

Elliotts jetty, about 300 feet (91^m4) long, projects south-south-eastward from Molo Principale, one cable north-eastward of Banchina

Chart 3353.

Chart 244.

Cagni, and there is a ruined jetty about one cable farther north-eastward.

Salvage quay, 500 feet (152^m4) long, with depths of from 4 to 7 feet 5 (1^m2 to 2^m1) alongside, lies at the north-eastern end of Molo Principale. The Naval basin is situated between Salvage quay and Banchina Cagni.

Coal quay, 180 feet (54^m9) long, with depths of from 4 to 8 feet (1^m2 to 2^m4) alongside, is situated about half a cable north-westward of the root of Repair jetty.

10 Police quay, 100 feet (30^m5) long, with a depth of 2 feet (0^m6) alongside, lies close south-westward of Coal quay; Police jetty, 200 feet (61^m0) long, with depths of from 2 to 6 feet (0^m6 to 1^m8) alongside, projects south-eastward from this quay.

Tug jetty, 160 feet (48^m8) long, with depths of from 17 to 19 feet 15 (5^m2 to 5^m8) alongside, is situated about three-quarters of a cable southward of the Police jetty.

Fisherman's jetty, 480 feet (146^m3) long, with depths of from 4 to 5 feet (1^m2 to 2^m5) alongside, lies close southward of Tug jetty.

20 Citadel quay (*Lat. 32° 54' N., Long. 13° 11' E.*), 500 feet (152^m5) long, with depths of from 3 to 10 feet (0^m9 to 3^m0) alongside, is situated about 1½ cables south-south-eastward of Fisherman's jetty.

Ceremonial jetty extends north-eastward from the eastern extremity of the Castle and is a boat landing. It is 100 feet (30^m5) long, with a depth of 7 feet (2^m1) at its head, shoaling to 2 feet (0^m6) at its inner 25 end.

Pontile IV Novembre, a small pier, with a depth of 7 feet (2^m1) near its head, projects northward about 3¼ cables east-south-eastward of Ceremonial jetty.

Molo Sottoflutto provides an oiling berth near its outer end; at its 30 inner end is a berth for seaplanes.

Port facilities.—A small amount of coal is kept in stock. Fuel oil is obtainable and piped to the oiling berth at Molo Sottoflutto; the capacity of the pumps is 80 tons an hour.

Water is laid on to Banchina Cagni and most of the other quays.

35 There is also a water-boat with a capacity of 400 tons.

The Port workshops are capable of carrying out medium repairs, including castings up to one cwt. There is a patent slip for small craft.

There are 3 tugs, 15 lighters and one Z craft available; there are also 7 pontoons.

40 Two floating cranes, with lifting capacities of 60 and 15 tons, respectively, are available.

Small quantities of fresh fruit and vegetables may be obtained.

There is a hospital in the town.

Town.—The town of Tripoli (ancient *Æa*) called by the natives 45 Tarabulus el-Gharb, stands on the rocky promontory of Rās el-Zur and is surrounded by a wall flanked by bastions. The Castle (*Lat. 32° 54' N., Long. 13° 11' E.*), a very ancient building, stands at the south-eastern corner of the wall. The old town is a mass of narrow streets and contains several mosques, the minarets of which are 50 prominent, particularly South minaret, situated close south-westward of the Castle. The clock tower stands about one cable north-north-westward of South minaret. In 1950, the population was 105,000.

The environs of Tripoli are low and flat; westward of the town the country is arid and sandy, but towards the southward and eastward it

Chart 2603.

Chart 244.

is thickly covered with palm trees interspersed with gardens and villages. The general appearance of Tripoli from seaward is striking, the white buildings contrasting with the surrounding vegetation.

The principal industries are the weaving of silk, woollen, and cotton fabrics, plaited work in esparto, reeds and palm leaves; gold, silver, and brasswork, ivory carving and the manufacture of tobacco.

Trade.—The chief exports are cattle, eggs, alfa, esparto, sponges, tunny in oil, hides, carpets, mats, rugs, dates, and henna. The chief imports are textiles, flour, wine, sugar, rice, tea, china, earthenware, glassware, metals, drugs, and medicines.

Communications.—There is regular steamer communication with Italy, also with Syracuse, calling at Malta and ports along the coast of Libya. Tripoli is connected to the Libyan railway system, and also to the general telegraph and telephone systems.

There is regular air communication with Great Britain, Malta and Italy.

Radio station.—There is a radio station at Tripoli. See page 15.

Climatic tables.—See page 31.

Chart 3353.

COAST.—**Lights.**—From the root of Molo Sottoflutto to Rās Tagiūra (Tajura) (*Lat. 32° 53' N., Long. 13° 23' E.*), 9½ miles eastward, the coast is sandy, and numerous rocks extend about half a mile offshore for a distance of 6 miles eastward of Porto di Tripoli.

A tunny establishment, situated on the coast about 4 miles eastward of Tripoli has, about half a mile eastward of it, a tower, 164 feet (50^m0) high, the lower part of which is cylindrical and the upper part quadrangular. See view facing page 40.

Sidi Andulsi marabout is situated on a hillock, in the middle of a barren area, about 3½ miles eastward of the tunny establishment; it becomes prominent only when the sun shines on it.



Sidi Andulsi marabout.

About one mile south-westward of Rās Tagiūra is the village of Tagiūra (Tajura).

A light for the use of aircraft is exhibited, at an elevation of 135 feet (41^m1), close to the tunny establishment.

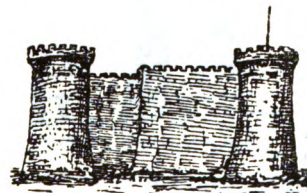
A light is exhibited, at an elevation of 78 feet (23^m8), from a square masonry tower, painted in black and white chequers, 24 feet (7^m3) in height situated on Rās Tagiūra. See view facing page 38.

Between Rās Tagiūra and the mouth of the Uadi Ramla, about 12 miles south-eastward, the coast at first is low and sandy, but later becomes high and rocky in places, with a line of reddish sand dunes.

Forte Trig el-Gefāra (Jefara), with two disused radio masts close to it, stands about 1½ miles south-south-eastward of Rās Tagiūra lighthouse.

A prominent wind pump stands near the coast about 6½ miles south-eastward of Rās Tagiūra lighthouse.

On the eastern side of the mouth of Uadi Ramla is the marabout of Sidi Ben-Nur (*Lat. 32° 47' N.*,



Forte Trig el-Gefāra.

Chart 2603.

Chart 3353.

Long. 13° 36' E.) and some barracks; thence to Rās el Hallab, about 10 miles eastward, the shifting sand dunes reach the sea.

5

*Sidi Ben-Nur marabout.*

10

Tunny fisheries.—Tunny nets are laid north-westward from Sidi Ben-Nur, and $2\frac{3}{4}$ miles north-north-westward from Sidi Sbeh Lahman, and may extend as far as $4\frac{1}{2}$ miles from the coast; the seaward end of these latter nets is near the shipping track and caution is

15 therefore necessary. See page 16.

Coast.—**Light.**—Rās el-Hallab is a dark-coloured rocky promontory, 44 feet (13^m4) high; shoal water extends from 2 to 3 cables offshore for a mile westward of the promontory, and a shoal patch, with a least depth of $2\frac{1}{4}$ fathoms (4^m1), lies about half a mile north-

20 westward of the lighthouse.

A light is exhibited, at an elevation of 103 feet (31^m4), from a grey circular tower, 59 feet (18^m0) in height, adjoining a house on Rās el-Hallab (*Lat. 32° 48' N., Long. 13° 48' E.*). See view facing page 38.

About 3 miles east-south-eastward of Rās el-Hallab is Rās Arbia, 25 a dark-coloured rocky point, and between these two points the coast is low and sandy; two streams, Uadi Turgut and Uadi Arbia, respectively, enter the sea along this stretch.

Between Rās Arbia and Rās el-Hamra, $4\frac{1}{2}$ miles eastward, the coast is low and sandy, with shifting sand dunes, and fringed by rocks 30 extending over half a mile offshore.

Gebel Tarhuna, with elevations of from 800 to 1,300 feet (243^m8 to 396^m2), extends parallel to the coast, at a distance of from 12 to 18 miles, between the meridians of Rās Tagiūra and Rās el-Hamra.

From Rās el-Hamra to the marabout of Sidi Abd el-Hādi (Ali), 35 about 6 miles south-eastward, the coast becomes higher and is steep, interspersed with rocky points and small sandy bays. Several streams, with groves of palms at their mouths and which dry in summer, flow into these bays. This stretch of coast is clear of off-lying dangers.

Bintal rock (*Lat. 32° 45' N., Long. 14° 00' E.*), which has a pointed 40 top, lies close offshore about 3 miles south-eastward of Rās el-Hamra.

Sidi Abd el-Hādi marabout, the only prominent object in this vicinity, is not, however, visible from seaward except from the north-eastward. Farther inland, standing at an elevation 45 of 438 feet (133^m6), and situated about 7 miles south-westward of Rās el-Hamra, is a large and prominent building known as Gasr Chiar (Kiar). About $6\frac{1}{2}$ miles eastward of Gasr Chiar is the marabout of 50 Sidi Abd el-Gani which is prominent when the sun shines on it, and appears as a white building.

Eastward of Sidi Abd el-Hādi the coast is hilly, sloping towards the sea, with dunes, on which there are stones, from about 60 to 160 feet (18^m3 to 48^m8) high. The country is well cultivated and there

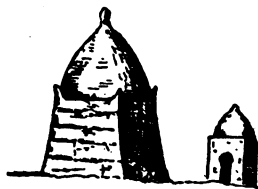
*Sidi Abd el-Gani marabout.**Chart 2603.*

Chart 3353.

are many villages in this vicinity; it is well watered by several streams which, however, dry in summer.

The marabout of Sidi Ramdan, $4\frac{3}{4}$ miles eastward of Sidi Abd el-Hàdi, is situated on a hillock near a small grove of palm trees; when the sun shines on it, it is visible for a distance of about 10 miles.

About $8\frac{1}{2}$ miles southward of Sidi Abd el-Hàdi is the old Spanish fortress Gasr el-Gusbât, standing on a mountain ridge, 1,132 feet (345^m0) high, which is a continuation of Gebel Tarhuna. It can be identified at a considerable distance, as may be the ruined tower of Msindra, in the Gebel Misselnata, about 2 miles northward of it.

The coast between Sidi Ramdan (*Lat. 32° 43' N., Long. 14° 08' E.*) and Râs el-Msenn (Elmsel) about 7 miles eastward, can easily be identified from seaward on account of the line of dunes which are of a yellowish or reddish colour, standing out clearly against the dark back-ground of hills. Several reefs extend about half a cable offshore in places.

Râs el-Msenn has a small column standing on a rock at its extremity, and southward of the point is a tunny establishment with three black chimneys. About half a mile south-westward of the point is the marabout of Sidi Bu Seda, which is hidden from the eastward by a hillock.

Gasr el-Mërcheb, a massive isolated stone fort, standing at an elevation of 590 feet (179^m8), is situated about $3\frac{1}{4}$ miles southward of Râs el-Msenn.

Between Râs el-Msenn and Râs el-Uzif, $2\frac{3}{4}$ miles south-eastward, the coast is barren.

Tunny fishery.—Tunny nets may extend as far as $4\frac{1}{2}$ miles from the coast off Râs el-Msenn. *See* page 16.

Anchorage.—Small craft, with a draught up to 16 feet (4^m9), and local knowledge, may obtain good shelter during north-westerly winds, in depths of from $3\frac{1}{4}$ to $3\frac{3}{4}$ fathoms (5^m9 to 6^m9), with good holding ground, about 3 cables southward of the extremity of the reef which extends about a quarter of a mile from Râs el-Msenn. *See* caution on page 1.

Chart 3353, plan of Homs (Khoms) anchorage.

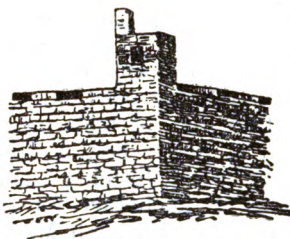
Homs.—Anchorage. — Lights.—The town of Homs (Khoms), situated close within Râs el-Uzif (*Lat. 32° 40' N., Long. 14° 17' E.*), stands on a spur of Colline del Mërcheb (Jebel Mergeb), and is backed by hills which include Sidi Barcu (Barku), about $2\frac{1}{4}$ miles south-eastward, and Râs el-Hammam, 385 feet (117^m3) high, about 4 miles south-south-eastward of the town. Provisions can be obtained. *See* view facing page 54.

A prominent minaret stands about 5 cables southward of the main lighthouse (*see* below).

Anchorage can be obtained, in a depth of $5\frac{1}{2}$ fathoms (10^m1), rock, with Râs el-Uzif bearing 281°, distant about $3\frac{1}{2}$ cables.

The small harbour is sheltered from north-easterly winds by a mole about $1\frac{3}{4}$ cables long, but is only available for small craft, which secure to a small wooden pier close southward of the mole.

A light is exhibited, at an elevation of 85 feet (25^m9), from a white



Gasr el-Mërcheb.

Chart 3353, plan of Homs (Khoms) anchorage.

circular tower, 61 feet (18^m6) in height, about 1½ cables south-westward of Rās el-Uzif. See view facing page 38.

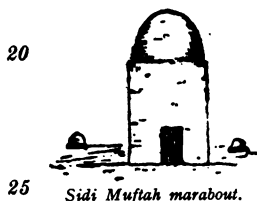
A light is exhibited, at an elevation of 26 feet (7^m9), from a grey iron framework structure, on a grey base, 13 feet (4^m0) in height, on the head of the mole. This light was extinguished in 1945.

Chart 3353.

Coast.—Eastward of Homs the inland mountain range becomes very uniform in character without any prominent features. The coast
10 between Rās el-Uzif and Sidi Barcu, about 2½ miles eastward, continues low and sandy, and, about 1½ miles south-eastward of Rās el-Uzif the Uadi Lebda flows into the sea on the southern side of Punta Lebda.

Punta Lebda is a black perpendicular cliff, with several ruined
15 columns standing on it, and was formerly the north-western extremity of the old Roman port of Leptis Magna, the ruins of which are now partially buried in sand. See view facing page 54.

Between Sidi Barcu (*Lat. 32° 38' N., Long. 14° 19' E.*) and Rās Sidi Magru, about 8 miles south-eastward, the coast is low and densely covered with palm trees reaching nearly to the sea. The marabout of Sidi Muftah, standing close to the beach, about 4 miles south-eastward of Sidi Barcu, is the only prominent object on this stretch of coast. On nearing Rās
20 Sidi Magru the coast becomes higher with steep



cliffs, which appear to be of a black or red colour according to the sun's relative position.

Two lines of reefs lie about one mile south-eastward of Rās Sidi
30 Magru, about half a cable and three-quarters of a cable offshore, respectively, forming a small bay, known as Marsa Ugra, which provides an anchorage for small craft with local knowledge.

Between Rās Sidi Magru and Zliten (Ziliten), about 8 miles east-south-eastward, the coast is bordered by sand dunes. One of these
35 dunes, known as Chéscem el-Marud, is slightly higher than the others, rounded and of a blackish colour, and surmounted by a small square pillar. Uadi Caàm (Khaham) flows into the sea about 1½ miles south-south-eastward of Rās Sidi Magru.

About one mile westward of Zliten the land rises abruptly and
40 continues high as far as Rās Maeri, about 4 miles eastward of Marsa Zliten.

Current.—The current usually sets north-westward at a rate of from a quarter of a knot to one knot, during the summer, along this part of the coast, but within a distance of one or 2 miles of the coast
45 the current is imperceptible.

Marsa Zliten. The village of Zliten Marina (*Lat. 32° 29' N., Long. 14° 34' E.*) stands close to the sea. The town of Zliten is situated about 2 miles inland and is connected to the main telegraph and telephone systems; it is surrounded by a wall and had, in 1941, a population
50 of about 4,000. Provisions may be obtained from the town.

Landmarks.—The following objects are prominent and easily identified:—El-Gàlab, a conical hill, about 100 feet (30^m5) high, with a small building on its summit, situated about 2 miles northward of the town of Zliten, and the marabout of Sidi Bu Rgheia (Rgeia), standing

Chart 2603.

Chart 3353.

on a summit, 105 feet (32^m0) high, about 1½ miles eastward of El-Galab hill. See view facing page 54.

Light.—A light is exhibited, at an elevation of 105 feet (32^m0), from an iron framework structure, the upper part of which is grey and the lower part painted in black and white stripes, 16 feet (4^m9) in height, on El-Galab hill.

Anchorage.—Anchorage may be obtained from 3 to 4 cables offshore, in a depth of about 5½ fathoms (10^m1). At night it is advisable to anchor farther out. This anchorage is quite open, and is only used in fine weather by vessels wishing to communicate with the shore.

Small craft with local knowledge may obtain shelter, from easterly and north-westerly winds, inside a reef which runs parallel to the coast, about one cable offshore, with an opening in it at either end. See caution on page 1.

Tunny fishery.—Tunny nets are laid north-north-westward from Marsa Zliten; these nets may extend as far as 4½ miles from the coast. See page 16.

Coast.—Between Marsa Zliten and Rās Maeri (*Lat.* 32° 29' N., 20 *Long.* 14° 39' E.) the coast is fringed by rocky shoals which extend as far as 7 cables offshore. A shoal, with a depth of 2 feet (0^m6), lies about half a mile northward of Rās Bu Rgheia, 1½ miles eastward of Zliten, and a 3¼-fathom (5^m9) patch lies about the same distance northward of Rās Maeri; both of these shoals are steep-to, and can be discerned by the light green colour of the water over them.

Rās Maeri can be identified from the westward by three small rounded summits of reddish or dark colour, according to the relative position of the sun, the point being abreast the easternmost summit; it also demarcates the belt of cultivated ground from the line of sand dunes.

Eastward of Rās Maeri, for a distance of about 2 miles, the coast is sandy, backed by scattered dunes, from 50 to 130 feet (15^m2 to 39^m6) high; it then abruptly becomes rocky with a line of steep cliffs, from 65 to 100 feet (19^m8 to 30^m5) high; towards the western end of these cliffs are three remarkable clefts. About 6 miles eastward of Rās Maeri the coast again becomes low, but its rocky nature continues, except for an occasional short interval.

Rās Hammud, a conical hill, 162 feet (49^m4) high, lies 9 miles east-south-eastward of Rās Maeri.

Rās el-Rméla (Ras er Rmela), about 200 feet (61^m0) high, is situated about 1½ miles east-south-eastward of Rās Hammud. It can be identified by its black colouring between two yellowish belts, and by three slight humps on its crest.

Eastward of Rās el-Rméla the sand dunes begin again and continue for 6 miles to the marabout of Sidi Bu Fatma. All this stretch of coast is fairly steep-to, but eastward of Rās Hammud (*Lat.* 32° 26' N., *Long.* 14° 48' E.) the bottom becomes more shelving, but is clear of dangers.

A large rock, lying about half a cable offshore, is situated about 3 miles eastward of Rās Hammud.

Scogliera di Zreggh (Zreg rocks), on which the sea breaks, lie about half a mile eastward of the large rock, just mentioned, and about 4 cables offshore; between them and the coast there are depths of

Chart 2603.

Chart 3353.

about 3 fathoms (5^m5), weed and sand, with good holding ground, but there is practically no shelter.

L'Oasi di Zregħ (Zreg), about 4 miles eastward of Rās Hammud, is surrounded by high sand hills, and in the middle of it is the ruined marabout of Sidi Bu Medfa.

Tunny fisheries.—Tunny nets are laid off Sidi Bu Fatma and Marsa Dzèira (*see* below) in a north-westward direction; these nets may extend as far as 4½ miles from the coast. *See* page 16.

10 **Coast.**—The coast between l'Oasi di Zregħ and Marsa Dzèira, about 6 miles eastward, is mostly rocky; between l'Oasi di Zregħ and the marabout of Sidi Bu Fatma shoals extend in places over half a mile offshore, and sand dunes, from about 165 to 230 feet (50^m3 to 70^m1) high, border the coast. Thence, as far as Marsa Dzèira, the coast
15 varies in height from 80 to 100 feet (24^m4 to 30^m5).

Henscir el-Com (Henshir el Kom), a conical hill, 77 feet (23^m5) high, lies about a mile south-eastward of Sidi Bu Fatma, and is prominent from the north-westward.

Marsa Dzèira is a small anchorage, available for small craft with
20 local knowledge, inside a line of rocks. A tunny factory, with a chimney, standing on the coast about 2½ miles eastward of Henscir el-Com, provides a good mark for making the anchorage.

The coast from Marsa Dzèira to Cabo (Ras) Misurata (ancient *Trierum prom*), about 4½ miles eastward, continues, for the most part,
25 to be high, whence it falls as far as Rās Zarrugh (Zorug), 6½ miles east-south-eastward.

The marabout of Sidi Murbàt (Marbat) (*Lat.* 32° 25' N., *Long.* 15° 06' E.), a prominent white building with a dome, stands on a yellowish-coloured hillock, about 140 feet (42^m7) high, about 3 miles eastward of
30 Marsa Dzèira.

Fuar el-Cab (Kab), a dark-coloured hill, 195 feet (59^m4) high, on which stands a pillar, which shows up well at a distance of 5 or 6 miles, is situated close southward of Cabo Misurata.

A line of rocks extends off Cabo Misurata, with a depth of 3½ fathoms
35 (6^m4), lying about 7 cables northward of the cape. Eastward of the cape the depths are more regular.

Chart 3353, plan of Misurata anchorage.

Rās Zarrugh is a low rocky point, from which a reef extends about one cable eastward. Southward of the point the coast is low, with
40 a line of dunes running parallel to it, and behind it is l'Oasi di Misurata.

About 2½ cables north-westward of Rās Zarrugh there is a large white house, and about three-quarters of a mile southward of the point is a hill with a ruined marabout standing on its summit.

Marsa Misurata.—Light.—Anchorages.—Marsa Misurata is an
45 indentation in the coast close southward of Rās Zarrugh.

A light (*Lat.* 32° 22' N., *Long.* 15° 13' E.) is exhibited, at an elevation of 79 feet (24^m1), from an iron framework structure on a square tower, painted in black and white vertical stripes, 28 feet (8^m5) in height, situated about 1½ cables westward of Rās Zarrugh.

50 Anchorage may be obtained in a depth of about 6 fathoms (11^m0), sand and rocks, with Rās Zarrugh light-structure bearing about 275°, at a distance of 3 to 4 cables from Rās Zarrugh. The holding ground, however, is poor and vessels are advised to quit the anchorage on the first signs of approaching bad weather.

Chart 2603.

To face page 54.

Sidi Barcu. Leptis Magna.

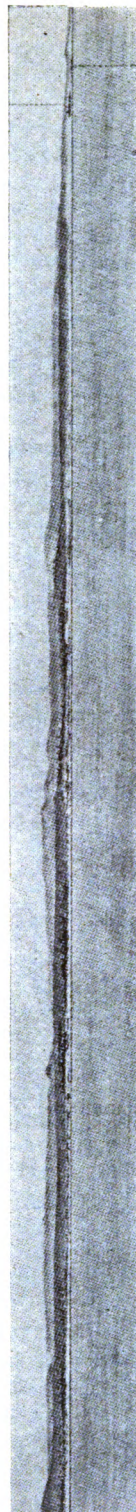
Minaret.

Râs el-Merchab.



Lighthouse.

Tunny establishment.



Râs el-Msemm.

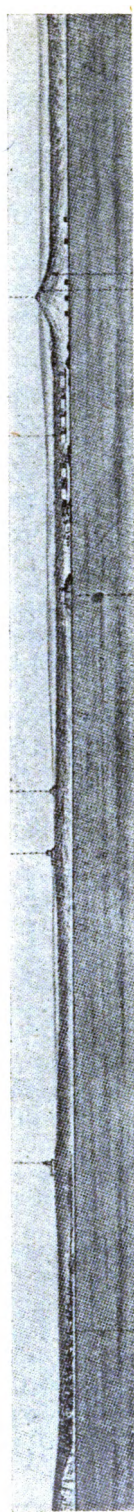
View, in two parts, of Homs from north-north-eastward, distant 5 miles.

Minaret.

Water tower. Marabout.

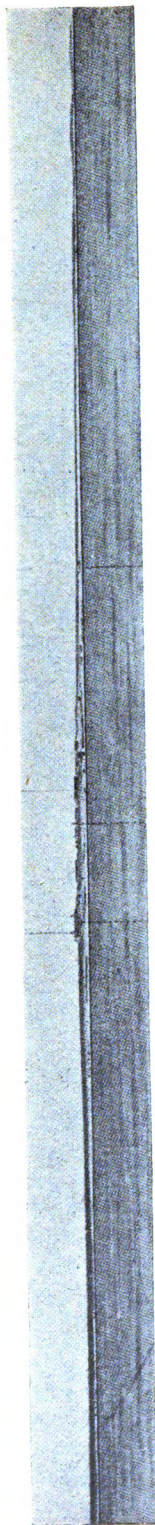
Zliten Marina.

El-Galab.



Zliten Marina from north-north-eastward, distant 4 miles.
 Leading Marks.
 (Originals dated 1931.)

Look-out station. Minaret.

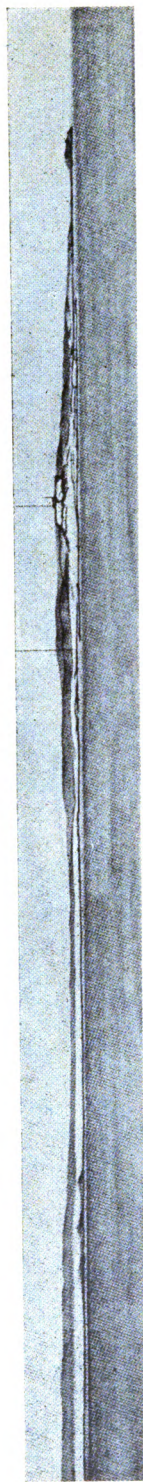


Fortino Biroti.

Sirte from north-north-eastward, distant 3 miles.

Roccia Nera,
bearing 293°,
distant 2 miles.

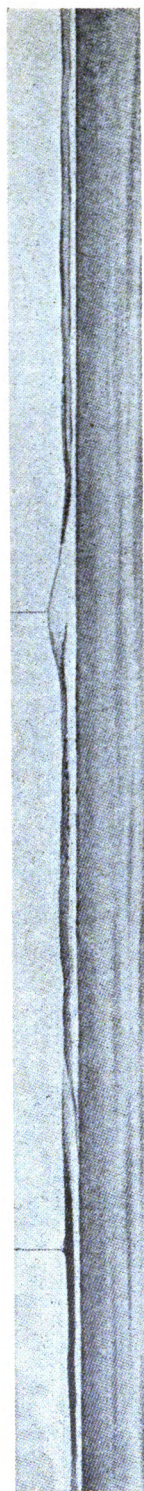
Redoubt.



Marsa el-Auégia from eastward.

Râs el-Adli,
distant 4 $\frac{1}{2}$ miles.

Gebel el-Adli.



Râs el-Aâli from north-north-eastward.

(Originals dated 1931.)

Chart 3353, plan of Misurata anchorage.

Anchorage can also be obtained, in a depth of about 5 fathoms (9^m1), with Rās Zarrùgh light-structure bearing about 290°, distant about 4½ cables. See caution on page 1.

Current.—During winter there is a south-easterly current with a rate of from one to 4 knots, caused by the prevailing north-westerly wind; for the remainder of the year the prevailing wind is south-easterly, which sets up a north-westerly current.

Misurata Marina.—Pier.—Misurata Marina stands on the western shore of Marsa Misurata, about 2½ cables south-westward of Rās Zarrùgh. The town was formerly enclosed by a wall, only parts of which now remain. In 1950, most of the buildings were reported to be derelict and the population to consist only of a few Arabs. The remains of old Roman baths lie close westward of Rās Zarrùgh light-structure.

A pier, about half a cable long, available only for lighters and boats, is situated about half a cable south-eastward of Rās Zarrùgh light-structure (*Lat.* 32° 22' N., *Long.* 15° 13' E.); in 1950, this pier was reported to be broken 150 feet (45^m7) from its root and to be in a state of disrepair.

Chart 3353.

Misurata.—The town of Misurata, which had, in 1945, a population of about 5,500, is situated about 5½ miles westward of Misurata Marina, to which it is connected by road. After Tripoli, it is the most important centre of trade in Tripolitania.

The chief exports are dates, butter, mats and woollen fabrics; the principal imports are barley, flour, tea, coffee, sugar, and cotton textiles.

The principal industries are carpet making, cattle raising and tunny fishing.

Charts 3353, 3354.

GOLFO DELLA SIRTE.—General remarks.—Golfo della Sirte, or Sidra (ancient *Syrtis major*), called by the Arabs Jun al Kabrit, is about 250 miles wide at its entrance between Rās Zarrùgh and Bengàsi (Benghazi), eastward of it. The shores are mostly low and sandy, and rocky reefs extend for a considerable distance offshore in places; there are extensive salt marshes, especially on the western shore.

There are two harbours in the gulf, but there are several partially sheltered anchorages, frequented chiefly by coasting craft engaged in sponge fishing from April to September.

Current.—Tide.—For current, see page 11 *et seq.* The tidal rise within the gulf is from 10 to 12 inches (0^m3).

Chart 3353.

Coast.—From Rās Zarrùgh to Rās Ramla, about 23 miles south-south-eastward, the coast is bordered by sand dunes almost devoid of vegetation, with a maximum height of 65 feet (19^m8), gradually becoming lower towards the south. The coast is rocky in places, and in other parts there is a low sandy beach backed by salt lagoons.

Chart 2603.

Chart 3353.

Fortino 28 Ottobre stands about one mile southward of Rās Zarrūgh and about a mile farther southward is a hill, 60 feet (18^m3) high, known as Bu Sceefa (Abu Sheifa).

- 5 Rās Tātīla (*Lat.* 32° 19' N., *Long.* 15° 16' E.), situated 4½ miles south-eastward of Rās Zarrūgh, is the termination of a prominent sandy hill, 50 feet (15^m2) high, known as Sergaab; the coast in this vicinity is rocky and shoal water extends about half a mile offshore.

- 10 Rās Rumia lies about 3½ miles south-eastward of Rās Tātīla. A brown dune, about 50 feet (15^m2) high, known as Ghilman (Gilman), which can be identified by a large dark-coloured bush on its summit, is situated about half a mile southward of Rās Rumia.

- 15 Between Rās Zarrūgh and Ghilman there are no dangers outside a distance of 1½ miles from the coast; the holding ground is good but there is no shelter.

- About 3½ miles southward of Ghilman there is a ruined fort, called Gasr el-Harar, close to which are some sand dunes, about 50 feet (15^m2) high. About 3½ miles farther southward is another sand dune, named el-Ogla, near which there is an above-water wreck; a small 20 village is situated about 3 cables northward of it.

- From Gasr el-Harar to Rās Rāmīla the coast is mostly fringed with rocks awash, which extend as much as a quarter of a mile offshore, and over which the sea usually breaks. From abreast Gasr el-Harar, for a distance of about 4 miles, a shoal, with depths of from 3½ fathoms 25 (5^m9) at its southern end to 5 fathoms (9^m1) at its northern end, extends parallel to the coast about 2 miles offshore. A spit, with a depth of 8 feet (2^m4) at its outer end, extends three-quarters of a mile offshore southward of el-Ogla.

- During north-westerly winds vessels may obtain a sheltered anchor- 30 age, with good holding ground, southward of Rās Cara (Khara) (*Lat.* 32° 08' N., *Long.* 15° 22' E.), about 1½ miles southward of el-Ogla.

- Bu Chedia (Kedia) and Es Smaida are two sand dunes, about 50 feet 35 (15^m2) high, lying 3½ miles south-south-westward and 6½ miles southward, respectively, of Rās Cara; the former is bare and blackish in colour, the latter brown.

- Small craft with local knowledge may obtain anchorage, sheltered to some extent from the north-eastward by a line of rocks awash, in 40 Marsa Marzuga (Martsuga), on the southern side of Rās Rāmīla in depths of about 7 feet (2^m1). This anchorage can be identified by the sand dunes backing it, one of which is 40 feet (12^m2) high, and another, farther northward, is covered with bushes. There is good landing here for boats.

- 45 **Coast.**—Tual, a conical sand dune, about 57 feet (17^m4) high, from a short distance northward of which a white patch extends to the rocky coast, stands, about 1½ miles inland, 5½ miles southward of Rās Rāmīla. A group of light-coloured sand dunes, about 25 feet (7^m6) high, named el-Taiara, are situated on the coast, about 10 miles south-south-eastward of Tual. A line of dunes with a maximum height of 50 72 feet (21^m9), named Gebel (Jebel) el-Melfa, runs parallel to the coast, from one to 1½ miles inland.

The ruined fort of Gasr Giàber (Jiaber), 13 miles southward of el-Taiara, stands on a hillock, 54 feet (16^m5) high, and forms a good landmark.

Chart 2603.

Chart 3353, plan of Bueràt el-Hsun (Burat el Sun).

The village of Bueràt el-Hsun (Burat el Sun) which, in 1950, was in ruins and only inhabited by a few Arabs, is situated about $16\frac{1}{2}$ miles south-eastward of Gasr Giàber (Jiaber). It may be identified by a white fort (*Lat.* $31^{\circ} 24' N.$, *Long.* $15^{\circ} 44' E.$) and a small white-domed monument which stand among the ruined buildings. 5

Off-lying dangers.—Fronting Bueràt el-Hsun, at a distance of from 2 to 3 miles offshore, and running nearly parallel to the coast for about 17 miles, is a line of dangers, the north-western part of which is known as Secca el-Héscia (Hissa bank) and the south-eastern part as Secca Zerid (Zerid rocks). The former is composed of sand, weed, and rocks, with a least depth of 14 feet (4^m3) over it, and the latter has a least depth of 13 feet (4^m0) over it. These dangers may be seen at a distance of from 3 to 4 cables as the water over them is of a dark green colour, which is in distinctive contrast to the white and black patches elsewhere. 15

Depths of less than 3 fathoms (5^m5) extend from the coast, in the vicinity of Bueràt el-Hsun, to a distance of about one mile.

There is a channel between Secca el-Héscia and Secca Zerid about a mile wide, with a least depth of 5 fathoms (9^m1) in the middle, north-eastward of Bueràt el-Hsun, which leads to the anchorage described below. 20

Current.—The current is usually influenced by the wind. During the winter with a strong north-westerly wind it sets south-eastward; in summer it usually sets north-westward a rate of from a quarter to half a knot. 25

Anchorage.—Directions.—A sheltered anchorage may be obtained off Bueràt el-Hsun, with the white-domed monument bearing 217° , about $1\frac{1}{2}$ miles offshore, in a depth of about $3\frac{1}{2}$ fathoms (6^m4), sand and weed, with excellent holding ground. The anchorage is a moderately safe one, but the working of cargo is liable to be hindered by the sea at times. See caution on page 1. 30

A vessel approaching Bueràt el-Hsun (*Lat.* $31^{\circ} 24' N.$, *Long.* $15^{\circ} 44' E.$) should bring the white-domed monument to bear 217° and then steer for it, on that bearing, which leads, in depths of more than 3 fathoms (5^m5), to the anchorage. 35

Port facilities.—A wooden pier, 525 feet (160^m0) long, extends north-eastward from the village, and is available for small steam vessels to berth alongside its south-eastern side, in depths of from 6 to 10 feet (1^m8 to 3^m0), but silting takes place, and caution is therefore necessary when proceeding alongside. In 1946, the pier was reported to be in a state of disrepair. 40

There is occasional steamer communication with other ports in Libya. Bueràt el-Hsun is connected to the general telegraph system. 45

Chart 3353.

Coast.—East-south-eastward of Bueràt el-Hsun the coast is bordered by sand dunes, the highest of which, known as Temed Hazzan, is white-coloured, 52 feet (15^m8) high, and situated about 14 miles east-south-eastward of Bueràt el-Hsun. About 20 miles from the village, a line of dark-coloured rocks fringes the coast, which are often visible at a considerable distance due to refraction. Eastward of these rocks the land rises to Collina di Mezauagh (Mezauag), 50

Chart 3353.

about 4 miles inland, which may be identified by its slightly conical shape and dark colour. On the coast, northward of this hill, is a white sand dune, on which there is a large bush, standing in front of a group
5 of palm trees.

Bu Rétma is situated $2\frac{1}{2}$ miles farther eastward and from thence to Sirte, about 11 miles eastward, there are no prominent landmarks.

Chart 3353, plan of Sirte.

10 **Sirte.**—The remains of the moles of the ancient port, which was probably *Aspis*, are still above water. The port can be identified at a distance of 10 miles by its minaret, the ruined Castle, the light-structure (*see below*) and Fortino Biroli. *See view facing page 55.*

15 The small harbour, now seldom used, is formed by the ancient moles and has a sand bottom with patches of rock. Some protection is afforded to small craft which can enter by two channels, the larger of which is about 200 feet (61^m0) wide. Boats drawing less than 4 feet (1^m2) can usually find complete shelter in a small pool, with
20 a soft sand bottom, situated about $5\frac{1}{2}$ cables west-north-westward of the light-structure.

Light.—A light (*Lat. $31^{\circ} 13' N.$, Long. $16^{\circ} 36' E.$*) is exhibited, at an elevation of 105 feet (32^m0), from a red iron framework structure on a square hut with black and white chequers, 22 feet (6^m7) high, close
25 south-eastward of Fortino Biroli. *See view facing page 38.*

Anchorages.—The best berth is in a depth of about 7 fathoms (12^m8), sand, with the minaret, bearing about 174° , and about 7 cables offshore. Small craft may obtain anchorage about 2 cables northward of the opening in the reef. *See caution on page 1.*

30 **Communications.**—There is regular steamer communication with Tripoli, Bengàsi (Benghazi), and Tòbruch (Tobruk). Sirte is connected to the general telegraph and telephone systems.

Port facilities.—Fresh provisions may be obtained in small quantities.

35 *Chart 3354.*

Coast.—Between Sirte and Rās es-Sultàn, about 42 miles east-south-eastward, there are no off-lying dangers; the western end of this stretch of coast is rocky and moderately high, reaching an elevation of about 120 feet (36^m6) in some places.

40 El-Camusk, 115 feet (34^m7) high, and Tuila, 148 feet (45^m1) high, are situated about 2 miles south-south-westward and south-south-eastward, respectively, of Sirte.

Collina di el-Garusc (El Garusk), 163 feet (49^m7) high, which can be identified by its dark colour and flat summit, is situated, about half
45 a mile inland, 20 miles eastward of Sirte, and is the most prominent object on this coast.

Eastward of Collina di el-Garusc (*Lat. $31^{\circ} 09' N.$, Long. $16^{\circ} 59' E.$*) the coast gradually falls in height and there is a line of low reddish sand dunes, of which Es-Sultàn, 48 feet (14^m6) high, with a conical
50 summit and several dark-coloured patches, lying $9\frac{1}{2}$ miles east-south-eastward of Collina di el-Garusc, is prominent.

A small cove, with a depth of $2\frac{1}{2}$ fathoms (5^m0) in the middle, in which small craft with local knowledge may obtain anchorage, is situated close westward of Es-Sultàn, but affords no protection in

Chart 3354.

bad weather. A village, also known as Es-Sultàn, consisting of a few huts and only visible for a short distance, lies close to the sand dune.

Rās es-Sultàn, the highest land in the vicinity, has an elevation of about 30 feet (9^m1). A large white house is situated about 4½ miles south-south-eastward of the point.

A rocky sunken reef, with a least depth of 3 fathoms (5^m5), extends about 1½ miles eastward from a position about 3 cables northward of Rās es-Sultàn, with depths of over 5 fathoms (9^m1) between its outer end and the coast southward.

A 3½-fathom (6^m9) patch lies 3½ cables eastward of Rās es-Sultàn, and a 4-fathom (7^m3) patch the same distance north-eastward.

Small craft with local knowledge may obtain anchorage, sheltered from northerly and north-westerly winds, southward of the above-mentioned reef.

A prominent reddish sand dune, with several black patches at its foot, is situated about 17 miles east-south-eastward of Rās es-Sultàn. About 3 miles farther east-south-eastward is Bir Umm el-Ghindel (Umm el Gindel), where the dunes show as three successive hummocks, the easternmost of which is lighter in colour than the others.

Gebèl Mdaur (Jebel Mdaur), 396 feet (120^m7) high, with a flat summit, situated about 5½ miles southward of Bir Umm el-Ghindel, is a good landmark.

Rās el-Auégia (Auejia) (*Lat.* 30° 55' N., *Long.* 17° 52' E.), about 6½ miles eastward of Bir Umm el-Ghindel, terminates in a high, dark rocky mass which is prominent from seaward. In this vicinity there are several sand dunes, between which and some hills farther inland is a large salt-marsh. About a mile south-eastward of Rās el-Auégia, on the coast, is a ruined redoubt which is, however, difficult to distinguish from seaward.

Anchorage.—Directions.—A rocky reef, with a least depth of 1½ fathoms (2^m7), extends 3½ miles east-south-eastward from Rās el-Auégia, and between it and the coast southward is Marsa el-Auégia (Auejia), where vessels with local knowledge may obtain anchorage, sheltered from northerly and north-westerly winds, in depths of from 5 to 8 fathoms (9^m1 to 14^m6), sand and weed, with the redoubt bearing 290°; the holding ground is good.

A vessel should approach Marsa el-Auégia on a south-westerly course, passing between the outer end of the reef extending east-south-eastward from Rās el-Auégia, and a 3½-fathom (6^m4) patch, situated about 2 miles south-eastward of the outer end of the reef, and when the redoubt bears 290° steer for it on that bearing to the anchorage.

Landing.—Landing may be effected about 1½ cables southward of the redoubt. *See view facing page 55.*

Off-lying shoals.—From a position about 7 miles east-south-eastward of Rās el-Auégia, a line of shoals, with a least depth of 3 fathoms (5^m5) at its western end, extends about 9½ miles east-south-eastward, from 1½ to 2½ miles offshore.

Coast.—From Rās el-Auégia to Rās el-Ihudia (Iudia), about 21 miles east-south-eastward, the coast continues low, but rises to Gebèl Ben Gauuàd (Jebel Ben Gauwad), about 165 feet (50^m3) high, in several rocky summits which can easily be identified from seaward,

Chart 3354.

and between which several streams flow into the sea ; farther inland is a higher ridge.

Bir Nezla (*Lat. 30° 54' N., Long. 17° 53' E.*), a light-coloured sand dune, surrounded by bushes and easily identified, is situated about 2½ miles south-south-eastward of Rās el-Auégia.

Uadi Ben Gauuād (Wadi Ben Gauwad) flows into the sea, close southward of a dark-coloured vertical cliff, about 13 miles southward of Rās el-Auégia. There is a large white house on the eastern side of the seaward end of the Uadi.

Rās Heriga, 2 miles north-westward of Rās el-Ihudia, may be identified as the middle one of three light-coloured sand dunes, rising in height from west to east, and standing out clearly against a brown plain. Rās el-Ihudia is the easternmost of these three dunes and readily distinguished by its green bushes.

A reef, with a least depth of 2 fathoms (3^m7) over it, extends east-south-eastward from Rās el-Ihudia, and depths of from 2½ to 4 fathoms (5^m0 to 7^m3) extend about three-quarters of a mile north-westward and northward from the point. Small craft with local knowledge may obtain anchorage southward of this reef, sheltered from north-westerly winds, with good holding ground of sand.

Sidi Zhaud, a hill, 137 feet (41^m8) high, and conical in shape, stands about 2½ miles south-westward of Rās el-Ihudia ; farther inland there is a higher ridge than that of which this hill forms a part.

A shoal, with a depth of 1½ fathoms (3^m2) at its southern end, extends about a mile, parallel to the coast, from a point about 5 miles south-eastward of Rās el-Ihudia, and is marked by discoloured water.

Es-Sider, a high white sand dune covered with bushes, sloping steeply to the sea, is situated about 11 miles south-eastward of Rās el-Ihudia ; a stream of the same name flows into the sea at this point. A large white house stands about 1½ miles westward of Es-Sider.

Rocks, awash, and shoal water extend about half a mile eastward from Es-Sider, and depths of from 2½ to 4 fathoms (4^m6 to 7^m3) extend 1½ miles south-eastward from the point ; some rocks, awash, also lie off the mouth of the Uadi Matratin, 2 miles south-eastward.

Rās Lanuf (*Lat. 30° 31' N., Long. 18° 34' E.*), a low sandy point, close off which lies the hulk of a small wreck, projects from the coast about 13 miles south-eastward of Es-Sider. A good landmark, when approaching this point, is a white two-storeyed building, situated a short distance inland, westward of the above-mentioned hulk, which, in clear weather, may be seen from a distance of 15 miles. South-westward of Rās Lanuf the inland ridge of hills assumes the shape of a tableland for a short distance, with the remarkable flat summit of Gebel Aban Shah, situated 5 miles south-westward of the point, and close to the Uadi el-Gtaf.

The town of Marble Arch, about 3 miles southward of Rās Lanuf, lies on the boundary line between Cyrenaica and Tripolitania, which extends on an approximate line 050°–130°.

Between Rās el-Ihudia and Rās Lanuf there are no dangers outside a distance of 1½ miles from the coast, thence to Rās Umm el-Garanigh (Garanig), 6½ miles south-eastward, the coast is sandy and fringed by rocks, awash, which extend only a short distance offshore.

A 4½-fathom (8^m7) patch lies about 2 miles east-south-eastward of Rās Lanuf and about 1½ miles offshore. A shoal spit, with a rock

Chart 3354.

awash at its outer end, extends about one mile east-south-eastward from Rās Umm el-Garanigh.

Rās el-Aàli (Ali), a low point, from which shoal water extends about half a mile eastward, with a depth of 10 feet (3^m0) at its outer end, projects from the coast about 8 miles east-south-eastward of Rās Umm el-Garanigh. *See view facing page 55.* A shoal, with a depth of 3½ fathoms (6^m4) over it, lies about 2¼ miles east-south-eastward of Rās el-Aàli.

Vessels with local knowledge, and a draught of less than 10 feet (3^m0), may obtain anchorage south-eastward of Rās el-Aàli, in depths of from 3¼ to 5 fathoms (5^m9 to 9^m1), sand and weed, sheltered from all winds except those between north-east and south-east.

A sand hill, 130 feet (39^m6) high, lies about 2 miles south-westward of Rās el-Aàli. In 1946, there was a jetty, about 500 feet (152^m4) long, with a depth of 12 feet (3^m7) alongside its head, at Rās el-Aàli (*Lat. 30° 23' N., Long. 18° 49' E.*).

South-eastward of Rās el-Aàli the coast continues low, barren, and uniform in character, backed by a tableland, the most prominent part of which is Gebèl el-Aàli (Jebel el Ali), consisting of two flat-topped ridges, 265 feet (80^m8) high, separated by a remarkable cleft about 7 miles southward of the point. *See view facing page 55.*

Gebèl el-Chasc (Jebel el Kask), 160 feet (48^m8) high, is situated, about three-quarters of a mile inland, 8 miles south-eastward of Rās el-Aàli, but is difficult to identify; about 12½ miles farther eastward, and one mile inland, there is a remarkable conical hill, known as Gebèl Bu Chscéiba (Jebel Bu Sheiba), 120 feet (36^m6) high.

Off-lying dangers.—Between Rās el-Aàli and El-Aghéila, 22 miles east-south-eastward, shoals with depths of from 3¼ to 5½ fathoms (5^m9 to 10^m1), lie as much as 2 miles offshore. A 2¼-fathom (4^m1) patch lies 9½ miles east-south-eastward of Rās el-Aàli and 1½ miles offshore, and a 2½-fathom (4^m6) patch about midway between it and the coast.

Chart 3354, plan of El-Aghéila.

El-Aghéila anchorage.—**Dangers.**—Scoglio Bu Sceéfa (Sheefa), a dark-coloured rock with a flat top, 8 feet (2^m4) high, lies about 4¼ miles west-north-westward of the site of El-Aghéila light-structure, and 1¼ miles offshore; it can be readily distinguished against the yellow background of the beach.

Depths of from 8 to 14 feet (2^m4 to 4^m3) extend about a mile westward, and a line of shoals, with a least depth of 11 feet (3^m4) and a depth of 16 feet at the outer end, extends about 4 miles eastward, respectively, from Scoglio Bu Sceéfa.

About 2 miles north-eastward of Scoglio Bu Sceéfa is another line of shoals, with a least depth of 17 feet (5^m2), extending about 3¼ miles eastward from a position about three-quarters of a mile north-westward of the rock.

Shoals, with depths of 4¼ and 4¾ fathoms (7^m8 and 8^m7) over them, lie about 3½ and 3¼ miles north-north-eastward of the site of El-Aghéila light-structure.

Anchorage may be obtained between the southern line of shoals, described above, and the coast, in depths of from 5½ to 11 fathoms (10^m1 to 20^m1), partially sheltered at its western end from northerly and north-westerly winds. A good berth is in a depth of about

Chart 3354, plan of El-Aghéila.

7½ fathoms (13^m7), sand and weed, with Scoglio Bu Sceéfa bearing 300°, distant about 8 cables.

Anchorage may also be obtained off El-Aghéila (*Lat. 30° 16' N., 5 Long. 19° 12' E.*), in a depth of about 9 fathoms (16^m5), with the look-out station, *see* below, bearing 185°, distant about 2 miles. *See* view facing page 64.

El-Aghéila.—El-Aghéila may be identified by some red buildings about half a mile inland and 2½ miles eastward of Gebèl Bu Chscéiba; 10 they have the appearance of forts, one of which is surrounded by a wall, on which there is a look-out station, consisting of a dark-coloured framework tower, visible at a distance of about 8 miles. Northward of these buildings is a small isolated white fort with a turret at each corner, standing on a hill about 60 feet (18^m3) high. Close to the 15 coast is a small house, painted in black and white chequers. *See* view facing page 64.

In 1945, the light-structure at El-Aghéila was destroyed and only the foundations remain.

There is a small pier northward of the light-structure, but it is of 20 little use as a landing place, being unprotected from the sea.

Directions.—A vessel should steer for the look-out station, bearing 185° and, if intending to anchor off El Aghéila, continue until about 2 miles from the station, but if intending to anchor south-eastward of Scoglio Bu Sceéfa, when Gebèl Bu Chscéiba bears 230° steer 260°, and 25 anchor when Scoglio Bu Sceéfa bears 300°.

Chart 3354.

Coast.—Sreghin (Sregin) (*Lat. 30° 16' N., Long. 19° 16' E.*), a black huminock, which shows up well against the sand dunes, lies about 3½ miles eastward of El-Aghéila; a sand dune, known as el-Mnaal, is 30 situated about 3½ miles east-north-eastward of it.

Collina di Bèscer (Beshér), a flat-topped hill covered with bushes, lies about 9 miles east-north-eastward of Sreghin, and about 1½ miles inland. Collina di Lim Resa, a saddle-shaped hill, stands on the coast about 4½ miles north-eastward of Collina di Bèscer; from a distance 35 this latter hill gives the appearance of an island.

Behind the sand dunes which border this stretch of coast are three extensive salt marshes, known, respectively, as Sèbches el-Mzerra, el-Mnèizla, and Mugtāa es-Seghír; the two latter contain traces of pure sulphur.

40 *Chart 3354, plan of El-Bréga.*

Marsa el-Bréga.—**Dangers.**—Marsa el Bréga is contained between a point about 5 miles north-eastward of Collina di Lim Resa, and Rās el-Magdār, 3½ miles north-eastward. It affords some shelter to small vessels at its south-western end, and the holding ground is 45 good, but the anchorage is open to the northward.

A light-coloured battery stands, at an elevation of 65 feet (19^m8), about 2 cables within the western entrance point of the bay; about half a mile southward of this battery are the ruins of a fort.

The small village of El-Bréga, or Mersa Bréga, which contains a 50 prominent minaret, is situated, on an elevation of about 130 feet (39^m6), 1½ miles east-south-eastward of the battery. A few provisions may be obtained from the village; it is connected to the general telegraph system. Landing may be effected on the sandy beach below the battery.

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Chart 3354, plan of El-Bréga.

Rocks, awash, extend $4\frac{1}{2}$ cables northward from the western entrance point of the bay, and a rocky patch, with a depth of 5 feet (1^m5), lies about 2 cables farther northward, thence shoals, with a least depth of 3 fathoms (5^m5), extend $1\frac{1}{2}$ miles north-eastward. 5

Rās el-Magdār (*Lat. 30° 26' N., Long. 19° 38' E.*) is fringed by foul ground which extends about 2 cables north-north-westward, and depths of less than 5 fathoms (9^m1) extend half a mile northward from the point.

Secca di Rās el-Magdār (El Magdar reef), on which there are two 10 rocks, awash, lies about a mile north-westward of Rās el-Magdār, and depths of from 2 to 3 fathoms (3^m7 to 5^m5) extend half a mile northward from the reef, thence shoals continue along the coast north-eastward.

Anchorage.—Directions.—Anchorage may be obtained, in a 15 depth of about $4\frac{1}{2}$ fathoms (8^m2), sand, with the battery on the western entrance point of Marsa el-Bréga, bearing 250° , distant half a mile, or in a depth of $3\frac{1}{2}$ fathoms (5^m9), with the battery bearing 270° , distant 4 cables. See caution on page 1.

A vessel approaching the anchorage should steer between 128° and 202° for a position about $1\frac{1}{2}$ miles north-north-eastward of the battery, and thence about 180° , which will lead to the anchorage.

Chart 3354.

Coast.—Dangers.—Islets.—A ruined fort stands, on a prominent black promontory, about 4 miles north-eastward of Rās el-Magdār, 25 and about 4 miles farther north-eastward there is a low hillock, known as Alizir.

Monte Lamàresc (Lamaresk), 202 feet (61^m6) high, with a truncated cone, is situated 6 miles north-eastward of Alizir, and forms a prominent landmark. See view facing page 64. About $16\frac{3}{4}$ miles north- 30 eastward of Monte Lamàresc, there is another low hillock, called El-Maher, $1\frac{3}{4}$ miles northward of which stands a tomb, known as Sidi Alib.

An old Turkish barracks, consisting of a prominent one-storied building, is situated on the coast about 4 miles northward of Sidi Alib; 35 from this point to Ez-Zuetina, about $3\frac{1}{4}$ miles north-north-eastward, the coast is sandy and backed by a reddish-coloured ridge, 80 feet (24^m4) high, known as Collina Pessana (Jebel Kaua).

Between Rās el-Magdār and Monte Lamàresc there are several shoals, with depths of less than 6 fathoms (11^m0), lying as far as 40 $2\frac{1}{4}$ miles offshore.

Secca Lamàresc Sud (South Lamaresk reef), awash, lies about $3\frac{1}{2}$ miles west-north-westward of Monte Lamàresc, and $2\frac{1}{4}$ miles off- shore. Scoglio Isceifa (Isheifa rock), above water, is situated about half a mile north-eastward of the reef and 4 cables offshore. Scoglio 45 Gemmàrisc (Jemmarisk rock), above water, lies about $12\frac{1}{4}$ miles north-north-eastward of Scoglio Isceifa (*Lat. 30° 35' N., Long. 19° 49' E.*), and about one mile offshore; there is foul ground between it and the coast.

Secca Lamàresc Nord (North Lamaresk reef), awash, lies about 50 $4\frac{1}{2}$ miles northward of Secca Lamàresc Sud, and from it a line of shoals and above-water rocks extends $14\frac{1}{2}$ miles north-eastward, parallel to the coast. There are deep channels between the two reefs, and also between the line of shoals and the coast.

Charts 2158b, 449.

Chart 3354.

Scoglio Eriscia (Hericha rock), above water, lies about $6\frac{1}{2}$ miles north-north-eastward of Secca Lamàresc Nord; a $4\frac{1}{2}$ -fathom (7^m8) patch is situated about $1\frac{1}{4}$ miles south-south-westward, and a $5\frac{1}{4}$ -fathom (9^m6) patch about $1\frac{3}{4}$ miles south-eastward, respectively, of the rock.

Isolotto Legaràh (Gharah islet), which is steep-to on its north-eastern side, lies about $2\frac{1}{2}$ miles north-north-eastward of Scoglio Eriscia, with a $2\frac{3}{4}$ -fathom (5^m0) patch about three-quarters of a mile south-westward of it. Two large above-water rocks lie close south-westward of Isolotto Legaràh, and depths of less than 5 fathoms (9^m1) extend for about a mile north-north-eastward from the islet. A shoal, with a least depth of $4\frac{3}{4}$ fathoms (8^m7) over it, lies $5\frac{1}{2}$ miles north-north-eastward of Isolotto Legaràh, and a 6-fathom (11^m0) patch about midway between.

15 *Chart 3354, plan of Ez-Zuetina.*

Tre Scogli are a remarkable group of rocks lying about one mile offshore and 4 miles south-westward of Ez-Zuetina light-structure. The group is joined to the coast by a narrow reef, with depths of from 6 to 13 feet (1^m8 to 4^m0) over it. See views facing page 65.

20 Scoglio Sud, the southernmost rock of the group, on which there is a pillar-shaped surveying mark, is 13 feet (4^m0) high, and dark coloured. A rock, awash, lies about half a mile south-westward of Scoglio Sud, and other dangerous shoals lie within $3\frac{1}{2}$ miles south-south-westward of this latter rock.

25 Scoglio Nord (*Lat. $30^\circ 56' N.$, Long. $20^\circ 04' E.$*), a group of rocks, the largest of which is 8 feet (2^m4) high, are situated about $2\frac{1}{2}$ miles north-north-eastward of Scoglio Sud. Between these two groups of rocks are several shoals, with depths of from one to $5\frac{1}{4}$ fathoms (1^m8 to 9^m6) over them. A rock, awash, lies half a mile north-north-eastward of

30 Scoglio Nord, and is nearly always visible by the sea breaking on it; several other rocky patches, with depths of from 2 to $2\frac{1}{2}$ fathoms (3^m7 to 4^m6) over them, lie within $1\frac{1}{2}$ miles north-eastward of the group.

Farther north-eastward, in the approach to the anchorage off Ez-Zuetina, the depths are irregular and a 4-fathom (7^m3) rocky patch lies about $2\frac{1}{4}$ miles north-eastward of Scoglio Nord; within half a mile of the coast, with this exception, the depths are over 4 fathoms (7^m3).

Caution.—The depths off the coast between Secca Lamàresc Sud and Ez-Zuetina, within a distance of from 5 to 6 miles at the southern end, and from 3 to 4 miles at the northern end, are so irregular that a vessel navigating in these waters must proceed with the utmost caution, as uncharted dangers may exist.

Chart 3354.

Anchorage.—Directions.—Anchorage may be obtained, by vessels with local knowledge, about $2\frac{3}{4}$ cables southward of Isolotto Legaràh, in a depth of about 8 fathoms (14^m6), well sheltered from northerly winds.

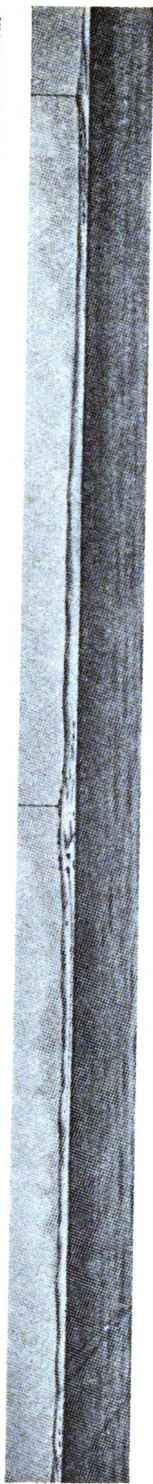
Chart 3354, plan of Ez-Zuetina.

Good anchorage may be obtained between Tre Scogli and the coast, sheltered from all winds except those between south and west, in depths of from $3\frac{3}{4}$ fathoms to $6\frac{1}{2}$ fathoms (6^m9 to 11^m9), sand, or rocks and weed. This is the only sheltered anchorage on the eastern side of the Golfo della Sirte (Sidra). The best berth is in a depth of $4\frac{3}{4}$ fathoms (8^m7), with the southern rock bearing 290° , distant about $4\frac{3}{4}$ cables; the wind seldom blows from between south and west.

Charts 2158b, 449.

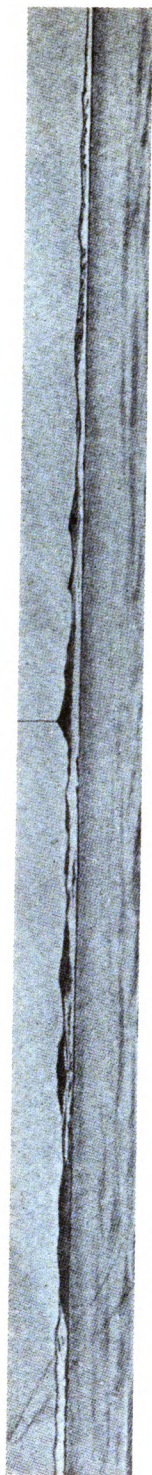
*Look-out station,
bearing 168°, distant 5½ miles.*

Gebel Bu Chacéba.



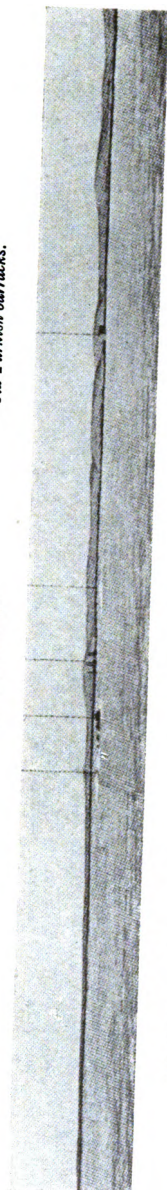
El-Aghéila and coast in the vicinity from northward.

*Monts Lamàresc,
bearing 102°, distant 5 miles.*



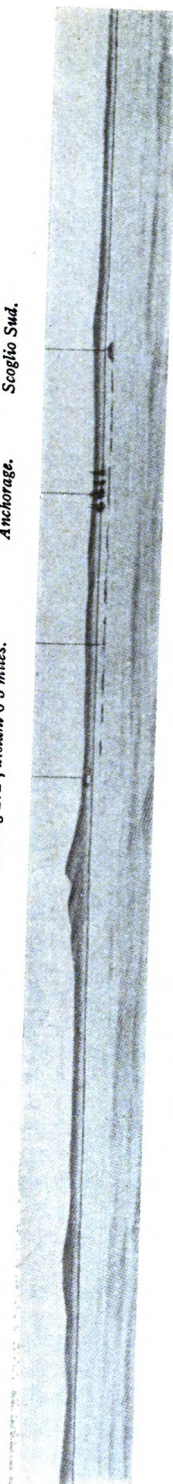
Monte Lamàresc and coast in the vicinity from north-north-westward.
(*Originals dated 1931.*)

Scoglio
Sud. Anchorage. Old Turkish barracks.



The Scogli anchorage from south-westward, distant $2\frac{1}{2}$ miles.

Old Turkish barracks,
bearing 172° , distant 0.5 miles. Anchorage. Scoglio Sud.



The Scogli anchorage from north-north-westward.
(Originals dated 1931.)

Chart 3354, plan of Ez-Zuetina.

The approach to this anchorage passes about $2\frac{1}{2}$ cables southward of Scoglio Sud (*Lat.* $30^{\circ} 54' N.$, *Long.* $20^{\circ} 03' E.$). Local knowledge is essential, and it should only be attempted in daylight. The old Turkish barracks, already mentioned, stands on the mainland abreast 5 the anchorage and provides an excellent landmark.

Ez-Zuetina.—Light.—The village of Ez-Zuetina is situated near a large white masonry redoubt, in the centre of which is a wooden framework tower, 65 feet (19^m8) high, about 4 cables inland; several prominent buildings stand near the coast. 10

A light is exhibited, at an elevation of 65 feet (19^m8), from an iron framework tower, 57 feet (17^m4) in height, situated near the coast about 4 cables west-south-westward of Ez-Zuetina village. See view facing page 38. This light was extinguished in 1945.

A reef runs parallel to the coast, about three-quarters of a cable 15 offshore, abreast the redoubt at Ez-Zuetina, with depths of from 5 to 8 feet (1^m5 to 2^m4) between it and the coast. The entrance to this area is through a passage in the reef, about a quarter of a cable wide, but only a vessel with local knowledge should use it.

Anchorage.—Directions.—Anchorage may be obtained by vessels, 20 in depths of from 7 to 8 fathoms (12^m8 to 14^m6), sand, with good holding ground, about 9 cables offshore, with the light-structure bearing 135° , distant about one mile. Small vessels may anchor about $4\frac{1}{2}$ cables offshore, abreast the buildings near the coast, mentioned above, over a sand and weed bottom. 25

A vessel intending to use the above anchorages should approach with the light-structure bearing between 130° and 140° , which leads between the off-lying shoals.

Coast.—About three-quarters of a mile north-north-eastward of the redoubt is a tall palm tree, and about $1\frac{1}{4}$ miles farther northward, close 30 to the coast, there is a prominent dark-coloured dune.

Chart 3354.

The coast northward of Ez-Zuetina has an arid and desert appearance of a reddish colour; Gebbānet Sciahauán (Jebbanet Shiahauan), a conical hill, 97 feet (29^m6) high, with a yellow building on its summit, 35 lies about 6 miles north-north-eastward of Ez-Zuetina light-structure (*Lat.* $30^{\circ} 57' N.$, *Long.* $20^{\circ} 07' E.$), and about $1\frac{1}{2}$ miles inland; about 10 miles farther northward, close to the coast, is a palm grove, 2 miles southward of which, and $1\frac{1}{2}$ and $5\frac{1}{2}$ miles northward, respectively, 40 stands a village.

A conspicuous sand dune, 92 feet (28^m0) high, is situated $18\frac{1}{2}$ miles northward of Ez-Zuetina light-structure, and $2\frac{1}{4}$ miles farther northward is the marabout of Sidi el-Mscéiti (Msheiti).

Off-lying dangers.—A line of shoals extends from a position about $2\frac{3}{4}$ miles west-north-westward of Ez-Zuetina light-structure, to a rock, 45 awash, known as Scoglio Elfie, about 11 miles northward, and $3\frac{1}{4}$ miles offshore. Between this line of shoals and the coast there are depths of from 8 to 9 fathoms (14^m6 to 16^m5). A 10-foot (3^m0) patch lies about $3\frac{1}{4}$ miles north-north-westward of the light-structure and nearly 2 miles offshore, and $2\frac{3}{4}$ miles northward of this patch is a shoal with a depth of $2\frac{1}{2}$ fathoms (4^m6); about midway between this shoal and Scoglio Elfie, is a 7-foot (2^m1) patch. 50

A shoal, with a least depth of 5 fathoms (9^m1) over it, lies one mile westward of Scoglio Elfie, and two shoals, each with a depth of

Chart 3354.

4½ fathoms (8^m2), lie 1½ and 4½ miles, respectively, northward of the rock. For a distance of about 8 miles north-north-westward from the latter shoal, there are depths of 5½ fathoms (10^m1) lying as far as 5 2½ miles offshore.

Current.—A strong current has been observed setting onshore between Ez-Zuetina and Scoglio Elfie.

Coast.—Northward of Sidi el-Mscéiti the coast is bordered by white sand dunes covered with bushes, from about 65 to 100 feet 10 (19^m8 to 30^m5) high. At Carcuretta (Karkuretta), 5 miles north-westward of Sidi el-Mscéiti, there is a small bight, protected by a rocky reef, available for small craft with local knowledge. A chain of hills, known as Gébel Huséin (Jebel Hussein), runs parallel to the coast about 5½ miles eastward of this bight.

15 The zona di Carcùra (Karkura) in this vicinity consists of a belt of relatively fertile coastal dunes, behind which is a large salt marsh, backed by a ridge of rocky hills with a few ruins on them, about 7 miles inland.

Punta Carcùra (Karkura), about 8 miles north-north-westward of 20 Carcuretta (*Lat.* 31° 21' N., *Long.* 20° 03' E.), is a low and rocky point, with the ruins of an old castle standing on it which, however, are only about 10 feet (3^m0) high, and not easy to distinguish. A reef and shoal patches extend about 1½ cables southward from the point and form the northern point of Baia di Carcùra, the entrance to which is about 25 3 miles wide.

Anchorage.—Anchorage may be obtained, by vessels with local knowledge, in Baia di Carcùra, in a depth of 3½ fathoms (6^m4), sheltered from winds from north-west, through north to south, with Punta Carcùra bearing about 307°, distant 6½ cables. The depths in the 30 bay are regular, with a bottom of sand and weed. See caution on page 1.

Coast.—From Punta Carcùra to the marabout of Sidi Habib, about 7½ miles northward, the coast consists of a tract of dunes and elevated ground, thence to the vicinity of Forte Bu Zeriba, 3½ miles farther 35 northward, it becomes lower, of uniform appearance, and covered with brushwood.

The white marabout of Sidi Bu Ràui, which stands about 6½ miles north-north-eastward of Punta Carcùra, is prominent, especially in the afternoon with the sun shining on it. Collinetta di Talambu, about 40 7½ miles northward of the same point, is also prominent. Forte Bu Zeriba, mentioned above, stands close to the coast and, although in ruins, is a good landmark.

About 3 miles eastward of Forte Bu Zeriba is l'Oasi di Ghemínes, in which there is a mosque with a white minaret visible between the 45 palm trees. About 2½ miles northward are two other palm groves, and an ancient fort, with a small low tower on its southern side, stands on a reddish-coloured hill southward of the oasis.

Coast.—The ruins of Gasr Bu Mscéili (Msheili) (*Lat.* 31° 43' N., *Long.* 19° 57' E.) are situated, about a mile inland, 5 miles north- 50 north-westward of Forte Bu Zeriba; the southern marabout of Sidi Bu Fachra (Fakra), partially in ruins, stands on the coast about 2 miles farther north-north-westward.

Two conspicuous palm trees are situated on the coast about 4½ miles northward of Sidi Bu Fachra, and a short distance farther northward is

Charts 2603, 2158b, 449.

Chart 3354.

a single prominent palm tree ; the village of Suani et-Terria, in which there is a mosque with a minaret, stands about 2 miles northward of this tree.

The northern marabout of Sidi Bu Fachra, about $4\frac{1}{2}$ miles northward of Suani et-Terria, and one mile inland, is 64 feet (19^m5) high, and conspicuous. From the southward its dome appears of a yellowish colour, but from the northward, especially with the sun shining on it, it appears white.

Rās Taiùnes (Tayones), a low, sandy point, is situated about $1\frac{1}{4}$ miles west-north-westward of the above marabout, and may be identified by a group of palm trees standing close inland of it.

Dangers.—Anchorage.—Buoy.—Between Punta Carcùra and Rās Taiùnes depths of 5 and $5\frac{1}{2}$ fathoms (9^m1 and 10^m1) extend as much as 2 miles offshore, in places. A shoal, with a depth of 28 feet (8^m5) over it, lies $2\frac{3}{4}$ miles south-westward of Rās Taiùnes, and a spit, with a depth of $2\frac{3}{4}$ fathoms (5^m0) at its outer end, and one fathom (1^m8) midway between, extends $1\frac{1}{2}$ miles south-south-westward from the point.

There is reported to be good anchorage off Rās Taiùnes.

Chart 3352, plan of approaches to Bengàsi (Benghazi).

Secca Berenice (Lat. 32° 01' N., Long. 19° 56' E.), a rock, awash, lies $3\frac{1}{2}$ miles northward of Rās Taiùnes and nearly $1\frac{1}{2}$ miles offshore ; between this rock and the coast there are depths of from 2 to 3 fathoms (3^m7 to 5^m5), and between it and Rās Taiùnes depths of less than 5 fathoms (9^m1) extend $1\frac{1}{2}$ miles offshore. A 2-fathom (3^m7) patch lies $3\frac{1}{4}$ miles north-eastward of Secca Berenice and $1\frac{1}{4}$ miles offshore, and a spit, with a depth of 2 fathoms (3^m7) at its outer end, extends about three-quarters of a mile offshore, from a position $5\frac{1}{2}$ miles north-eastward of Secca Berenice.

From Rās Bu Sceiba (Sheiba), situated about 10 miles north-north-eastward of Rās Taiùnes, a spit, with a depth of 4 feet (1^m2) at its outer end, extends about three-quarters of a mile westward.

A shoal, with a depth of 20 feet (6^m1) over it, lies about 4 cables west-south-westward of the head of Molo della Giuliana (*see below*) ; a conical buoy, painted in black and white vertical stripes, moored, is about three-quarters of a cable northward of the shoal.

PORTO DI BENGÀSI.—The port of Bengàsi, situated between Peninsola (Punta) della Giuliana, $1\frac{1}{4}$ miles northward of Rās Bu Sceiba, and Rās Sidi Chreibisc (Kreibiesh) consists of Nuovo Porto (North harbour), Vecchio Porto (Middle harbour), and Sèbchet el-Bunta (South harbour). *See views facing page 70.*

Vecchio Porto.—Dangers.—Buoy.—Vecchio Porto, called Marsa Giuliana by the Arabs, from the name of the peninsula which forms the south-western side, is protected on the northern side by Banchina Vasey (Vasey quay), which extends about 700 feet (213^m4) west-south-westward from the western extremity of the town, and by Molo Italia, which extends south-south-westward for about a farther 700 feet (213^m4), and by Molo Centrale (Central mole). On the south-western side, a breakwater, known as Molo della Giuliana (Giuliana mole), extends about 6 cables north-westward from the inner side of Peninsola della Giuliana. Vecchio Porto is much encumbered with shoals, with depths of less than one fathom (1^m8) over them. Rocks, awash, lie $1\frac{1}{2}$ cables north-westward, and half a cable northward, respectively, of

Chart 3352, plan of approaches to Bengàsi (Benghazi).

the head of Molo Italia, and about three-quarters of a cable north-westward of the head of Molo Cattedrale (Cathedral breakwater), at the eastern end of the harbour.

- 5 A channel, with a least depth of 7 feet (2^m1), leads close southward of the head of Molo Italia and thence to Banchina della Giuliana (Cathedral quay) (*Lat. $32^\circ 07' N.$, Long. $20^\circ 03' E.$*). The bottom consists of sand, mud, and weed, with occasional rocky patches. Silting takes place when sand is brought down by the winter rains, so dredging is
10 found necessary to maintain the depth in the channel.

Chart 3352, plan of Porto di Bengàsi.

- Sèbchet el-Bunta.**—A narrow passage, crossed by a pontoon bridge, which is removed during the winter months, connects the southern end of Vecchio Porto with Sèbchet el-Bunta, an extensive salt
15 lagoon, lying south-eastward of Vecchio Porto. In 1946, a short channel had been dredged, to a depth of 11 feet (3^m4), eastward from the entrance to Sèbchet el-Bunta.

- Nuovo Porto.**—Nuovo Porto lies between Molo Centrale and Molo Esteriore (Outer mole), which extends about $3\frac{1}{2}$ cables north-westward,
20 from a position $1\frac{1}{2}$ cables north-north-eastward of the eastern extremity of Banchina Vasey, and thence about 5 cables south-westward. Molo Esteriore has been badly damaged and, in 1946, gave very little protection from the north or north-west. The south-eastern part of Nuovo Porto is being reclaimed; in its north-western part there are
25 depths of from $3\frac{1}{2}$ to $6\frac{1}{2}$ fathoms (6^m4 to 11^m9) rock. During strong westerly winds a heavy scend sets into Nuovo Porto.

- Landmarks.**—The following objects are conspicuous and easily identified:—El Monumento della Giuliana, consisting of a bronze statue standing on a broad pyramidal base, 69 feet (21^m0) high, situated
30 on the Penisola della Giuliana; the Dux granary, about $1\frac{1}{2}$ miles eastward of El Monumento della Giuliana; the Cathedral, a rectangular building surmounted by two domes, situated $6\frac{1}{2}$ cables north-eastward of El Monumento della Giuliana; the main lighthouse (*Lat. $32^\circ 07' N.$, Long. $20^\circ 04' E.$*), which stands $6\frac{3}{4}$ cables north-north-
35 eastward of the Cathedral, and a minaret, 110 feet (33^m5) high, with another minaret close southward of it, situated 2 cables south-westward of the main lighthouse.

- Other prominent objects are:—The Palazzina del Governatore, 98 feet (29^m9) high, on the north-eastern shore of Porto Vecchio; the
40 mast of the Signal station, 112 feet (34^m1) high, situated $3\frac{1}{4}$ cables north-westward of the Cathedral. See view facing page 70.

- Lights.**—A light, known as Bengàsi light, is exhibited, at an elevation of 133 feet (40^m5), from a three-storied white masonry tower, 109 feet (33^m2) in height, situated in Sidi Chreibisc cemetery, about
45 $1\frac{1}{4}$ miles north-north-eastward of El Monumento della Giuliana. See view facing page 39.

A light is exhibited, at an elevation of 32 feet (9^m8), from an iron framework structure, 20 feet (6^m1) in height, situated on the head of Molo della Giuliana.

- 50 A light is exhibited, at an elevation of 26 feet (7^m9), at the southern extremity of Molo Italia.

Beacons.—Mooring buoys.—A beacon, 14 feet (4^m3) high, consisting of a masonry base, surmounted by an iron framework superstructure, marks the 5-foot (1^m5) patch about $1\frac{1}{2}$ cables south-south-

Chart 3352, plan of Porto di Bengàsi.

eastward of the head of Molo Italia. A similar beacon, but without the superstructure, 7 feet (2^m1) high, marks the 7-foot (2^m1) patch about one cable west-north-westward of the head of Molo Cattedrale.

A grey iron framework beacon, about 30 feet (9^m1) in height, is situated near the root of Molo Italia (*Lat. 32° 07' N., Long. 20° 03' E.*). 5

There are several mooring buoys in Porto Vecchio, three of which are numbered and all of which are indicated on the chart.

Pilots.—Pilotage is compulsory for all mechanically propelled vessels over 50 tons net register, and for all sailing vessels over 100 tons net register. The pilot's boat is painted white and flies Flag H of the International Code of Signals. 10

Signal station.—**Signals.**—When a vessel arrives off the port the following signals are displayed from the signal station:—Flag D of the International Code of Signals indicates "Ship sighted"; flag L indicates "Ship will be berthing at Banchina New Zealand"; flag Y indicates "Ship will be berthing off Banchina Vasey"; and flag Z indicates "Ship will be securing between Nos. 1 and 2 mooring buoys." 15

Current.—**Water level.**—The current usually sets southward off Bengàsi. See page 11. 20

During May, on occasions when the ghibli (page 24) is blowing, the water level is low; during February, March, and April, especially during northerly and north-easterly winds, the water level is very low, falling about 2 feet (0^m6) below mean sea level; during June, July, and August, when westerly and south-westerly winds prevail, the water level rises about 1½ feet (0^m4) above mean sea level. 25

Chart 3352, plan of Approaches to Bengàsi.

Anchorage.—**Directions.**—Anchorage may be obtained in the roadstead off Bengàsi, northward and westward of Molo Esteriore, and westward of Molo della Giuliana, but strong westerly winds cause a very heavy sea, which renders the anchorage dangerous; during the winter it is seldom possible to remain at the anchorage. 30

A vessel approaching from the south-westward should keep from 2 to 3 miles offshore, in order to avoid the rocky shoals which lie south-westward of the port. If approaching from northward, a vessel should make the land north-eastward of the port, especially in thick weather, or with an offshore wind, as there are better landmarks here than south-westward, and the approach is clear of dangers, except for Secche di Driana (page 72), about 19 miles north-eastward of Bengàsi lighthouse (*Lat. 32° 07' N., Long. 20° 04' E.*). 40

Chart 3352, plan of Porto di Bengàsi.

A vessel proceeding into Porto Vecchio should pass about midway between the heads of Molo della Giuliana and Molo Esteriore, then close westward of Molo Italia, and thence be guided by the beacons. This approach was obstructed, in 1948, by the two halves of a tanker, situated about midway between the head of Molo della Giuliana and Molo Italia, and by a dredger sunk off the head of Molo Italia. A vessel should pass south-westward of the stern half of the tanker and thence between the head of Molo Italia and the dredger. 45

Prohibited anchorages.—Anchorage is prohibited in Nuovo Porto within an area, indicated by pecked lines on the chart, between the head of Molo Centrale and the south-eastern side of Molo Esteriore. 50

Chart 3352, plan of Approaches to Bengàsi.

Anchorage is also prohibited in an area, indicated by pecked lines

Charts 3354, 2603, 2158b, 449.

Chart 3352, plan of Approaches to Bengàsi.

on the chart, situated north-westward of the northern end of the town (*Lat. 32° 08' N., Long. 20° 04' E.*).

Chart 3352, plan of Porto di Bengàsi.

- 5 **Quays.—Berths.**—Vessels with a draught not exceeding 14 feet (4^m3) can lie alongside Banchina New Zealand, the eastern side of Molo Italia. Vessels with a draught not exceeding 10 feet (3^m0) can proceed to Porto di Cattedrale. This harbour is protected on its northern and western sides by Molo Cattedrale, which extends west-
10 north-westward and thence south-westward from the northern end of Banchina Cattedrale. The harbour consists of Banchina Cattedrale, alongside which, in 1946, there were many small obstructions and wrecks, and a wooden jetty, also named after the Cathedral, extending about 310 feet (94^m5) south-south-westward from the northern part of
15 Molo Cattedrale, and alongside which there is a depth of 10 feet (3^m0). Banchina Cattedrale is connected to the State Railway system.

Nos. 1 and 2 mooring buoys are situated, respectively, about half a cable north-north-eastward, and 1½ cables northward, of the head of Mole della Giuliana, forming a berth, with a least depth of 22 feet
20 (6^m7). This berth is used by tankers, which discharge through a floating pipe line to the head of Molo della Giuliana.

Close eastward of the root of Molo Italia there is a small masonry pier, with a depth of 10 feet (3^m0) at its head; this is the best landing place in Porto Vecchio.

- 25 **Harbour regulations.**—The following are extracts from the Harbour regulations:—

All steam vessels berthed either alongside or end-on at Banchina Cattedrale, or the jetty in Porto di Cattedrale; and at Molo Italia, are to keep steam during the harbour working hours.

- 30 It is forbidden to discharge overboard either in the harbour or in the roadstead any burning material, ashes, or rubbish of any kind.

The loading and discharging of inflammable material and explosives must be carried out in accordance with the directions of the Harbour master.

- 35 Vessels arriving with a dangerous cargo onboard must anchor in the approach channel to Porto di Cattedrale so as to lie at the greatest possible distance when stern on to the quay. Vessels loading such cargo must, according to their tonnage, either anchor in the roadstead, off the end of Molo Italia (*Lat. 32° 07' N., Long. 20° 03' E.*), or tem-
40 porarily in the approach channel.

Vessels which burn fuel oil must clean out their bilges before arriving in the roadstead or the harbour.

Fuel oil must not be embarked without permission from the Harbour master.

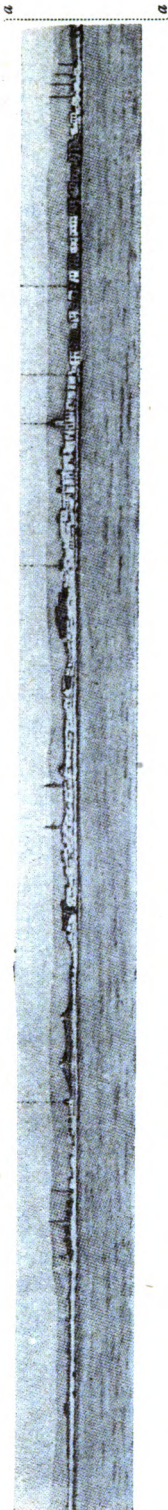
- 45 **Bengàsi.**—Bengàsi (ancient *Berenice*), the capital of Cyrenaica, stands on the extremity of a low point on the north-eastern side of Porto Vecchio and is backed by salt lakes and marshes, the latter being often inundated during northerly gales. Many large public buildings have been erected during recent years which have changed the old
50 city into a modern European town. In the neighbourhood are the two suburbs of Sidi Hussein and El Berca, the latter with its large barracks. The north-eastern part of the town is chiefly inhabited by Arabs, and the southern portion by Europeans. The population, in 1948, was 60,000.

Charts 3354, 2603, 2158b, 449.

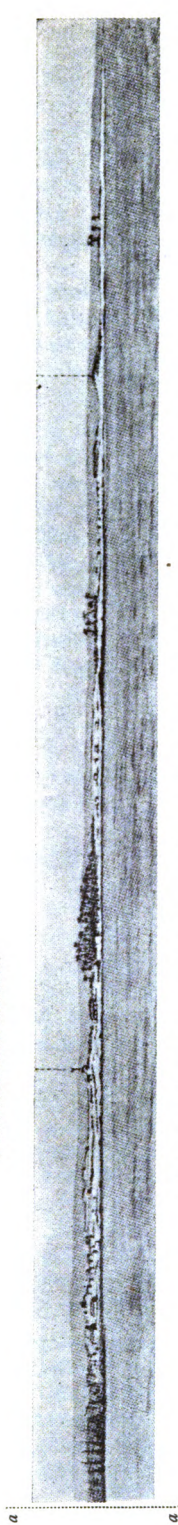
Old lighthouse,
bearing 070°, distant 14 miles.

Signal
station.

Governor's
palace.



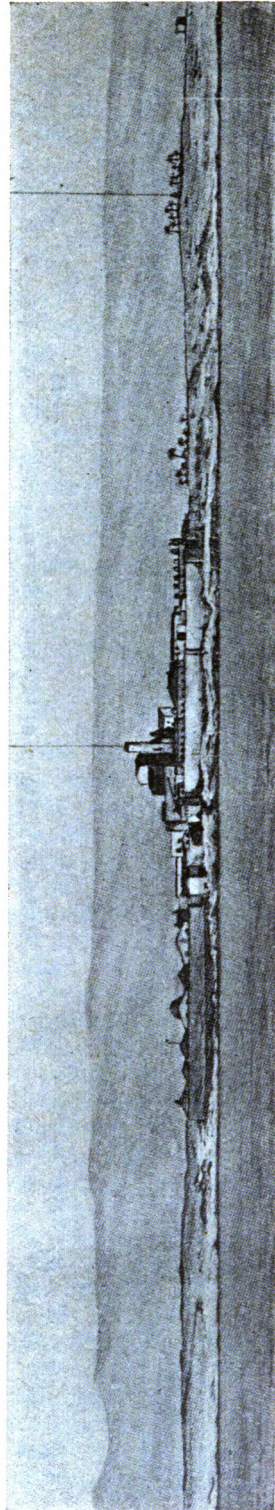
Monumento della Civiltà.



View, in two parts, of Bengàsi from west-south-westward.

White tower,
bearing 135°, distant 6 cables.

Minaret.



Tòcra from north-westward.
(Originals dated 1931.)

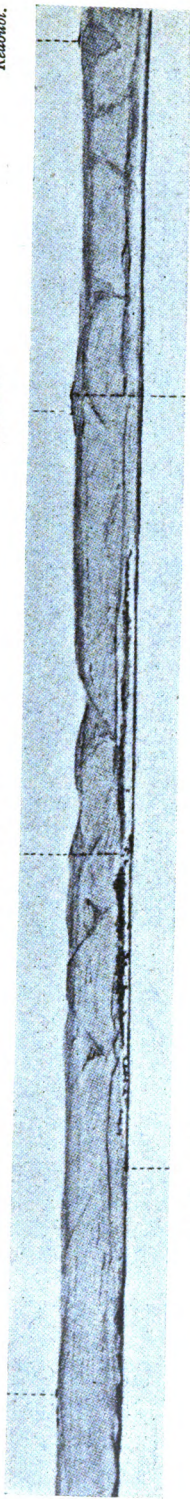
To face page 71.

Redoubt.

Lighthouse, bearing
135°, distant 4 miles.

Reservoir.

Redoubt.

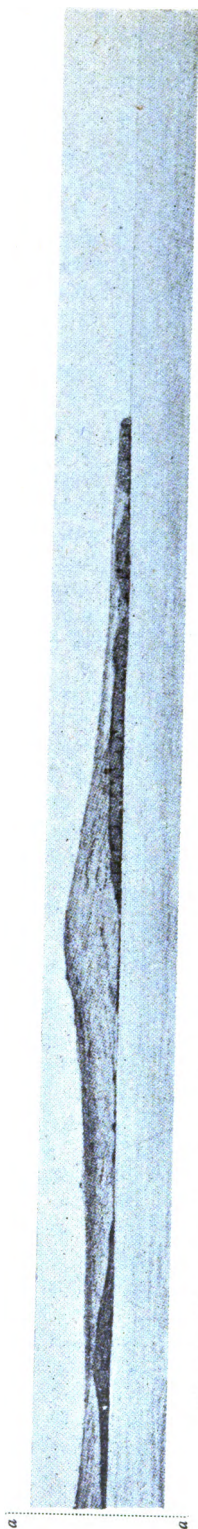
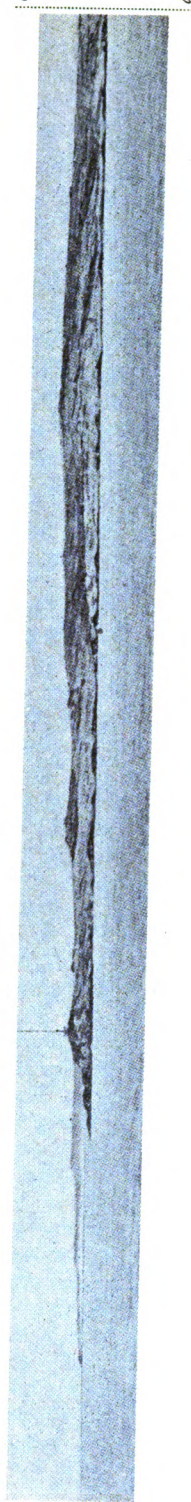


Northern mole.

Derna from north-westward.

Redoubt.

Râs et-Tin lighthouse,
bearing 167°, distant one mile.



View, in two parts, of Râs et-Tin and coast in the vicinity from north-north-westward.
(Originals dated 1931.)

Chart 3352, plan of Porto di Bengàsi.

Industries and Trade.—The principal industries are the weaving of goat hair cloths, making carpets and rugs, tents, tallow, gold and silver ornaments; the building industry and the packing of tunny fish in oil have been greatly developed. 6

The principal exports are sheep, wool, hides, goat hair fabrics, woollen rugs, mats, etc. The chief imports are foodstuffs, tobacco, textiles, metals, pottery, china, earthenware, glass ware, chemical products, etc.

Port facilities.—Fresh provisions may be obtained. About 10 1,000 tons of coal are kept in stock. Water is laid on to the quay and jetty in Porto di Cattedrale, and also to Banchina New Zealand and Banchina Vasey (*Lat. 30° 07' N., Long. 20° 03' E.*).

Small repairs to vessels can be carried out. There are two small patent slips capable of taking vessels of 80 tons displacement. 15

There are two hand cranes, the larger having a lifting capacity of 5 tons, and a derrick, on Banchina Vasey; there is also a derrick on Banchina New Zealand. In addition there is a 60-ton floating crane as well as several small, caterpillar, travelling-cranes.

Two small tugs and numerous lighters are available. 20

Communications.—Bengàsi is connected to the general telegraph and telephone systems.

Radio station.—There is a Radio station at Bengàsi. *See* page 15.

Climatic tables.—*See* page 32.

Chart 3354.

COAST.—Dangers.—The coast between Rās Sidi Chreibisc and the village of Tòcra (Taukra), about 36 miles north-eastward, consists of sand dunes, about 35 feet (10^m7) high, behind which lies a belt of land, arid and stony in parts, but cultivated and fertile in others. This land belt, interspersed with salt lagoons, rises gradually inland to a range of hills, about 820 to 980 feet (249^m9 to 298^m7) high. This range, which extends north-eastward and gradually approaches the coast, is intersected by deep gullies. 25

From Punta Driana, situated 21 miles north-eastward of Rās Sidi Chreibisc, a natural salt lake, known as Sebchet el-Cuz (Sebkhet el Kuz), extends for 6 miles north-eastward close to the coast. 35

Between Rās Sidi Chreibisc and Punta Driana (*Lat. 32° 23' N., Long. 20° 20' E.*) the coast is clear of dangers except for a 3-fathom (5^m5) patch, about 4½ miles south-westward of Punta Driana and 1½ miles offshore, and a few rocky patches, with depths of 5½ fathoms (10^m1) over them, lying within 1¼ miles of the coast. The most prominent objects on this stretch of coast are:—A reddish-coloured fort, surmounted by a turret, standing on the coast 2¾ miles north-north-eastward of Rās Sidi Chreibisc; the white buildings of the penal colony and the battery at el-Coèfia (Koefia), situated 5 miles north-eastward of the reddish-coloured fort, and the radio masts at Sidi Chalifa (Kalifa), about 9 miles northward of el-Coèfia battery. A building with a white square tower stands about 4½ miles south-westward of Punta Driana, and about half a mile inland; about one cable farther inland is the marabout of Sidi Sueiker, which has not the usual dome and presents the appearance of a small, square white house. Farther inland, on the range of hills mentioned above, and about 15 miles eastward of Rās Sidi Chreibisc, is the village of Er-Régima 40

Charts 3354, 2603, 2158b, 419.

Chart 3354.

(Rejima), standing at an elevation of about 1,050 feet (320^m0); a fort, standing at an elevation of 941 feet (286^m8), is situated 1½ miles north-westward of the village. The marabout of Sidi Muftah, with a white dome, stands at an elevation of 311 feet (94^m8), about 6½ miles eastward of Râs Sidi Chreibîsc. A prominent Roman ruin, known as Gasr et-Tuil, stands, at an elevation of 311 feet (94^m8), about 13 miles north-eastward of Râs Sidi Chreibîsc; it is especially prominent from the north-westward.

10 **Light**.—A light is exhibited, at an elevation of 70 feet (21^m3), from a white stone building with a square tower, 50 feet (15^m2) in height, at Sidi Sueiker (*Lat.* 32° 20' N., *Long.* 20° 17' E.).

Tunny fishery.—Tunny nets are usually laid out every year and extend about 2½ miles westward from Mengâr es-Seghir, about 4 miles north-eastward of Râs Sidi Chreibîsc. See page 16.

Coast.—Punta Driana is a rocky but inconspicuous point; it may be identified by numerous low, reddish-coloured ruins in the vicinity, and by the white houses, surrounded by palm trees, of Driana village, situated about 2½ miles south-westward of the point. North-eastward of the village are the ruins of Tansolûch (Tansoluk), which are of a grey colour and show up well against the reddish background. About 9 miles east-south-eastward of Punta Driana, Com el-Asel (Kum el Asel) rises to an elevation of 1,147 feet (349^m6) and may be easily identified. About 9 miles north-eastward of Punta Driana, on the coast, are the ruins of Gasr et-Mtânnèb, 1½ miles southward of which stands the marabout of Sidi Abd el-Giauuâd (Jiawad), and 2½ miles north-eastward, on the coast, that of Sidi Abd es-Salâm (*Lat.* 32° 30' N., *Long.* 20° 31' E.).

Dangers.—Secche di Driana, with depths of from 2½ to 5½ fathoms (4^m9 to 10^m1) over it, lies about 2 miles offshore and extends about 5½ miles north-eastward from a position about 2½ miles westward of Punta Driana.

Tòcra.—The village of Tòcra (ancient *Tauchira*) stands close to the coast. See view facing page 70. It has the appearance of a small fortified town with numerous buildings within its walls, dominated by one much higher than the others, with a white tower; a minaret is situated south-westward of the village. The walls of the village are the best preserved Roman remains in the whole of Cyrenaica.

Tòcra is connected to the general telegraph and telephone systems.
40 **Coast**.—From Tòcra to Tolemaide (Tolmeita), 22 miles north-eastward, the coast is rocky and bordered by a narrow sandy beach. The range of hills abreast this stretch of coast present a rugged aspect, and the streams descending from it reach the sea through deep gullies.

45 A conspicuous fort stands about 3½ miles eastward of Tòcra. The marabout of Sidi el-Mabrûch (Mabruk) is situated, on the coast, 7½ miles north-eastward of Tòcra, and the ruined marabout of Sidi Machluf (Makluf) stands about 2 miles farther east-north-eastward.

Dangers.—Secche Zejret (Zeyret reef), with a depth of less than 6 feet (1^m8) over it, lies nearly a mile offshore north-westward of Sidi Machluf. Secche Batraba (Batraba reef), with a depth of less than 6 feet (1^m8) over it, lies three-quarters of a mile offshore, 4½ miles north-eastward of Secche Zejret (*Lat.* 32° 37' N., *Long.* 20° 43' E.).

Coast.—A remarkable small group of palm trees stands about

Chart 3354.

2 miles north-eastward of the marabout of Sidi Machluf. About $2\frac{1}{4}$ miles farther north-eastward, at Gasr el-Jemca, there is a house with the gable end facing seaward; $1\frac{1}{4}$ miles north-eastward of Gasr el-Jemca, and half a mile inland, there is a prominent brown building with a round tower. The marabout of Sidi Abdalla, white coloured with four domes, with a battery adjoining, is situated about $5\frac{1}{4}$ miles north-eastward of the brown building, mentioned above. 5

A sunken reef extends between a half and three-quarters of a cable from a point about one mile north-eastward of Sidi Abdalla; it is well marked by the discoloration of the water and by breakers. 10

Chart 3355, plan of Tolemaide (Tolmeita).

A conspicuous ruin, consisting of a large mausoleum in the Grecian style, built on a foundation of limestone rock, and which has the appearance of a large square tower, is situated about three-quarters of a mile north-eastward of Sidi Abdalla. 15

Tolemaide.—Light.—Tolemaide (ancient *Ptolemais*) is a village standing on the shores of a small bight, which formed the ancient port. The land behind the village rises to a range of high round-topped hills; on the western side of the bight is a small promontory. The village is noted for its antiquarian remains. 20

Tolemaide is connected to the general telegraph and telephone systems.

A light is exhibited, at an elevation of 56 feet (17^m1), from a grey iron framework structure over a white hut, 23 feet (7^m0) in height, situated on the summit of the promontory on the western side of the bight (*Lat. $32^\circ 43' N.$, Long. $20^\circ 53' E.$*). See view facing page 39.

In summer, during fine weather, vessels with a draught of 8 feet (2^m4) may approach to a distance of about a quarter of a cable of the piles, about one cable south-eastward of the light-structure. Boats can pass between the rocks, and land on the beach. 30

Anchorage.—The ancient port of *Ptolemais* was formed by a break-water running parallel to the coast, but it is now destroyed. Small craft usually anchor with their sterns secured to the shore, but the anchorage is entirely exposed. Vessels may also obtain anchorage in a depth of about 10 fathoms (18^m3), with good holding ground of sand, about $5\frac{1}{4}$ cables north-westward of the light-structure. See caution on page 1. 35

Current.—Tides.—For current, see page 11.

The lowest water levels are experienced in February, March and April, especially with northerly and north-easterly winds. The highest water levels occur in June, July and August, especially with westerly and south-westerly winds. During the remainder of the year there is practically no rise or fall; the tidal range is about 16 inches (0^m4). 40

Chart 3355.

Coast.—The coast eastward of Tolemaide becomes more rugged and the ridges of hills approach nearer the sea, rising steeply to about 1,000 feet (304^m5). A rocky bank, lying about half a mile offshore, extends nearly to abreast of Rās Tolemaide (Tolmeita), about 7 miles north-eastward of Tolemaide light-structure. 50

Rās Tolemaide is steep-to and may be identified, from eastward and south-westward, by a remarkable peak rising about midway up its seaward face.

A rock, above water, lies about $2\frac{1}{4}$ miles north-eastward of Tolemaide

Charts 2158b, 449.

Chart 3355.

light-structure, and about 3 cables offshore; close westward of this rock is another rock, awash.

- The coast between Rās Tolemaide and Gasr Disa (*Lat.* $32^{\circ} 47' N.$, *Long.* $21^{\circ} 25' E.$), a prominent yellow dune, 108 feet (32^m9) high, about 17 miles eastward, is rugged and steep; thence to Chascem el-Chelb (Kashem el Khelb), 108 feet (32^m9) high, about 3 miles north-eastward, there is a beach of sand and rocks, backed by a narrow strip of swampy ground with natural salt marshes. The coast is bordered with numerous rocks, some of which are awash, but outside a distance of one mile there are no dangers.

About $2\frac{3}{4}$ miles north-eastward of Chascem el-Chelb is the village of El-Hania. In this vicinity there are several sandhills on which stand prominent forts, which can be identified from off Rās Tolemaide.

- 15 A reddish-coloured building in ruins stands about one mile south-westward of El-Hania village, and northward of this building is a small cove, which affords anchorage to small craft with local knowledge; larger vessels may anchor farther out over a sandy bottom, sheltered from southerly winds.
- 20 Between El-Hania village and Rās el-Hamāma, about $7\frac{1}{2}$ miles north-eastward, there are a number of sandy coves indenting the low rocky coast, but they afford no shelter. The white marabout of Sidi Abd ed-Dàien, surmounted by a dome, stands $2\frac{1}{2}$ miles south-south-westward of Rās el-Hamāma; it is, however, hidden by a sand dune
- 25 on a south-easterly bearing.

Rās el-Hamāma (ancient *Phycus prom*) may be identified by the ruins of a fort on it and by the mouth of large cave. Collina di Eluet Mesaoud, 546 feet (166^m4) high, lies $1\frac{1}{2}$ miles southward of Rās el-Hamāma, and is a good landmark.

- 30 Between Rās el-Hamāma (*Lat.* $32^{\circ} 56' N.$, *Long.* $21^{\circ} 37' E.$) and Rās Aāmer, about 4 miles east-north-eastward, and thence to Apollonia, about $13\frac{1}{2}$ miles farther eastward, there is a narrow, rocky beach, lying at the foot of some hills which rise steeply to a height of over 650 feet (198^m1); this range of hills, the sea face of which is like a wall,
- 35 and broken by deep ravines, has a remarkable appearance. The wreck of a floating dock, stranded on the beach about midway between Rās el-Hamāma and Rās Aāmer is conspicuous.

- About 7 miles south-westward of Apollonia, and $4\frac{1}{2}$ miles inland, is the town of Cyrene, of great archaeological interest, with about
- 40 2,000 inhabitants, standing on two hills separated by a stream.

Off-lying bank.—A bank, with a depth of 49 fathoms (89^m6) over it, the position of which is approximate, was reported, in 1945, to lie about $16\frac{1}{2}$ miles west-north-westward of Rās el-Hamāma.

- Light.**—A light is exhibited, at an elevation of 98 feet (29^m9), from
- 45 a black iron framework structure, 39 feet (11^m9) in height, on Rās Aāmer. See view facing page 39.

Chart 3355, plan of Apollonia.

- Apollonia.**—**Light.**—Apollonia, with about 800 inhabitants, stands, surrounded by green vegetation, between two small elevations,
- 50 on each of which there is a battery; eastward of the town is a group of columns which are the remains of the ancient town. A small promontory extends northward from the middle of the town, and on its eastern side is a small bight, in which there is a jetty. Boats can land on the sandy beach in fine weather.

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Chart 3355, plan of Apollonia.

The principal exports are skins, tallow, wool, charcoal, and firewood.

A motor road runs to Cyrene and Apollonia is connected to the general telephone and telegraph systems.

A light (*Lat. 32° 54' N., Long. 21° 58' E.*) is exhibited, at an elevation of 82 feet (25^m0), from an iron framework structure on a hut, 29 feet (8^m8) in height, at Apollonia. *See view facing page 39.*

There is a flagstaff on a building situated about 1½ cables west-south-westward of the light-structure. The minaret, standing about half a cable south-south-eastward of the light-structure, and a belfry, about half a cable south-eastward of the flagstaff, are good landmarks.

Dangers.—Off the western end of the town there is foul ground with an islet and some rocks, above water, lying about 1½ cables offshore, which afford shelter to small craft with local knowledge.

Secca Seignelay (La Seignelay shoal), with a least depth of 16 feet (4^m9) over it, lies 2 cables north-north-eastward of the northern extremity of the small promontory on the western side of the light; a shoal with a depth of 11 feet (3^m4) over it, lies 2¼ cables eastward of Secca Seignelay.

Scoglio Hammàm, an above-water rock, and Scoglio Sharkea, about half a cable eastward of it, lie off the eastern end of the town, about 1½ cables offshore. Foul ground, with rocks awash and above-water, extend offshore eastward of the town. A 14-foot (4^m3) patch lies about 2¼ cables north-eastward of Scoglio Sharkea.

Anchorages.—Anchorage may be obtained, with good holding ground, in depths of from 5½ to 10 fathoms (10^m1 to 18^m3), sand and rock, with Apollonia light-structure (*Lat. 32° 54' N., Long. 21° 58' E.*) bearing less than 159°. The anchorage is, however, exposed to winds from west, through north, to east. *See caution on page 1.*

Current.—The current sets eastward, but sometimes it flows in the opposite direction due to easterly winds.

Chart 3355.

Coast.—Radio masts.—Eastward of Apollonia the coast is less rugged than westward of it, and the slopes of the hills inland are less steep. A remarkable cave near the coast, about 4½ miles eastward of Apollonia, is noticeable from northward. A group of sand dunes, known as Rās el-Aslāb, with a cairn on the southernmost, are 147 feet (44^m8) high, and lie close to the coast, about 7½ miles east-north-eastward of Apollonia.

A rock, with a depth of 3 feet (0^m9) over it, lies about 2 miles east-north-eastward of Apollonia light-structure, and about a quarter of a mile offshore; it is usually marked by breakers.

Two radio masts are situated near the coast about one mile eastward of Apollonia light-structure.

Chart 3355, plan of Marsa el-Hilāl.

Rās el-Hilāl, 3½ miles eastward of Rās el-Aslāb, is moderately low; foul ground extends about 2 cables northward from the northern part of the point, and rocky patches extend over 1½ cables from the eastern extremity of the point.

Light.—A light is exhibited, at an elevation of 59 feet (18^m0), from a white, iron framework structure, with black bands, on a masonry base, 27 feet (8^m2) in height, situated on Rās el-Hilāl. *See view facing page 39.*

Marsa el-Hilāl.—Marsa el-Hilāl is an open bay lying southward

Chart 3355, plan of Marsa el-Hilâl.

of Râs el-Hilâl; at the southern end of the bay the shore rises to Châscem Rahâb (Kashem Rahab), a hill with a rounded summit, about 1,180 feet (359^m7) high, situated about 2 miles south-south-
 5 westward of Râs el Hilâl light-structure (*Lat. 32° 55' N., Long. 22° 10' E.*), but northward and north-westward the land maintains a uniform height of about 100 feet (30^m5).

The shores of the bay are indented by two small coves in which there are large caves visible from seaward. About half a mile south-south-
 10 westward of the light-structure is a building with a tower, and the village of Râs el-Hilâl, which can be identified by its white houses and a minaret, lies about 4 miles southward of the light-structure.

At the head of the bay there is a beach, composed of rock and pebbles, from which a concrete pier extends about one cable south-
 15 eastward. There is a depth of 4 fathoms (7^m3) alongside this pier shoaling to one fathom (1^m8) at its inshore end; a dolphin lies off the pier and between it and the pierhead there are submerged concrete blocks. In 1950, there were two gaps of 35 feet (10^m7) each at the inshore end of this pier.

20 At the southern end of the bay, about 1½ miles southward of the light-structure, there is an old Roman jetty, now awash.

Fresh provisions can be obtained.

Anchorage.—Landmarks.—Good anchorage may be obtained, well sheltered from winds between north-north-west, through west,
 25 to south-east, in depths of from 6 to 10 fathoms (11^m0 to 18^m3), with good holding ground of sand and weed. Small craft may obtain good shelter from northerly winds close in under the shore.

Approaching from the north-eastward, a white square building with a minaret, situated about 2½ miles southward of Râs el-Hilâl light-
 30 structure, is prominent. A watch tower, standing about 8 cables south-westward of the light-structure, is also a prominent landmark.
Chart 3355.

Coast.—The coast between Râs el-Hilâl and Râs Ben Gebâra (Jebara), 10½ miles east-south-eastward, is steep and rugged. The
 35 village of Fiorita, the white buildings and small minaret of which show up well against the dark background, lies about 6½ miles south-eastward of Râs el-Hilâl light-structure (*Lat. 32° 56' N., Long. 22° 10' E.*).

About 4 miles south-south-eastward of Râs el-Hilâl light-structure is the hilly spur of Eluet Delfia, 1,807 feet (550^m7) high, and 6½ miles
 40 farther eastward is Argub Malta, a sharp-pointed conical hill, 987 feet (330^m8) high, which is especially prominent when seen off Râs el-Hilâl.

The Uadi el-Atrûn flows through a deep ravine about midway along this stretch of coast. Râs Ben Gebâra may be approached to a distance of half a mile.

45 Between Râs Ben Gebâra and Râs Bu Azza, about 15 miles east-south-eastward, the coast is rocky and the range of hills recedes inland. Remains of military works are visible on these hills, and there is a chimney about 5½ miles north-north-westward of Râs Bu Azza, and half a mile inland. About 3½ miles from Bu Azza, close to the coast,
 50 is the Bu Msâfer battery. Close north-westward of this battery is a small cove, with a pebble beach and bottom, where small craft with local knowledge may obtain good shelter from north-westerly winds.

About 2 miles inland, south-westward of Bu Msâfer battery, is another battery and a small, dark-coloured, cylindrical tower, standing

Charts 2158b, 449.

Chart 3355.

on the highest ground in the vicinity and showing up well against the yellow ground. A prominent tower stands about $2\frac{1}{2}$ miles south-westward of Rās Bu Azza.

Danger.—Scoglio di Chèrsa (Kersah rocks) (*Lat. $32^{\circ} 51' N.$, Long. $22^{\circ} 30' E.$*), about $6\frac{1}{2}$ miles east-south-eastward of Rās Ben Gebàra and $1\frac{1}{2}$ miles offshore, are a group of rocky islets, from which sunken rocks extend northward, the outermost danger being about 2 miles offshore. There is a navigable channel between the islets and the coast, but vessels are recommended not to use it. 5 10

Chart 3355, plan of Derna.

Derna.—Near Derna the range of hills is broken by a remarkable ravine, through which flows the Uadi Derna. On either side of this ravine are redoubts, both of which can easily be identified from seaward; the tall circular structure of a reservoir stands close to the 15 western redoubt.

On nearer approach the following additional objects may be readily identified :—The lighthouse, situated on Rās Bu Azza; a monument, standing about three-quarters of a cable east-north-eastward of the lighthouse; the masts of the Radio station, about $1\frac{1}{2}$ cables south-eastward of the lighthouse, and the Caserma Salsa, a large barracks, 20 standing on high ground, about 11 cables south-south-eastward of the lighthouse. See view facing page 71.

Harbour.—**Obstruction.**—The harbour lies between two moles, the northern of which extends about 2 cables south-eastward from 25 Rās el-Mataris, the southern entrance point of Uadi Derna. The southern mole extends about a cable north-eastward from a position about $3\frac{1}{2}$ cables south-south-westward of the head of the northern mole, but much of it has been destroyed by the sea. The harbour is subject to constant silting, caused by large quantities of weed brought 30 in by the current.

In 1931, the harbour was accessible for vessels with a draught not exceeding 16 feet (4^m9). In 1947, it was reported that shoaling had taken place in the harbour.

An obstruction extends about one cable south-westward from the 35 head of the northern mole and is connected to it by a bridge. Vessels with a draught not exceeding 12 feet (3^m7), can berth on the western side of this obstruction.

About half a cable from the head of the northern mole (*Lat. $32^{\circ} 46' N.$, Long. $22^{\circ} 40' E.$*), a small stone pier extends south-westward for 40 about 50 feet (15^m2). In 1947, there was a depth of 9 feet (2^m7) at the head of this pier, increasing to about 3 fathoms (5^m5) towards the middle of the harbour.

There is a mooring buoy about one cable west-south-westward of 45 the head of the northern mole.

Lights.—A light is exhibited, at an elevation of 92 feet (28^m0), from a white cylindrical tower on a white square dwelling, 37 feet (11^m3) in height, situated on Rās Bu Azza. See view facing page 39.

A light is exhibited, at an elevation of 34 feet (10^m4), from a black, iron framework structure on a hut, 23 feet (7^m0) in height, on the head 50 of the northern mole. This light was extinguished in 1947.

Anchorage.—**Directions.**—Anchorage may be obtained by vessels with a draught of more than 15 feet (4^m6), in a depth of about 9 fathoms (16^m5), sand and coral, about $4\frac{1}{2}$ cables north-eastward of the light-

Chart 3355, plan of Derna.

structure on the head of the northern mole. The anchorage is exposed to winds from west, through north, to south-east; there is, however, good holding ground. The water is extremely clear in the bay, the bottom in calm weather being visible up to a depth of about 8 fathoms (14^m6).

A vessel entering the harbour should not pass within one cable of the northern mole head, on account of the obstruction extending south-westward from it.

- 10 **Current.**—The current off Derna sets south-eastward at a rate of about one knot, but its direction and rate are influenced by the wind.

Town.—Derna (ancient *Zephrion*) (*Lat.* 32° 46' N., *Long.* 22° 39' E.), with a population, in 1948, of 15,000, is an important centre, situated at the mouth of the Uadi Derna. In addition to the Roman Catholic church there are eight mosques, of which the largest is remarkable for its 42 domes.

There is a Custom house and a hospital in the town.

Provisions may be obtained and water is available at the stone pier on the south-western side of the northern mole.

- 20 There are two small pontoons in the harbour.

The principal exports are skins, wool, tallow, and cattle.

Radio station.—There is a radio station at Derna. See page 15.

Chart 3355.

Coast.—The coast from Derna to Rās et-Tin, about 25 miles east-south-eastward, is high with bold cliffs backed by a high tableland. The coast becomes lower on nearing Rās et-Tin, where it projects as a low tongue of land.

The marabout of Sidi Aòn (On) lies about 13 miles south-eastward of Rās Bu Azza lighthouse and about one mile inland, and about 7 miles farther is a very prominent cylindrical tower, standing on the tableland. The high ground inland of Rās et-Tin is a good landmark on all bearings. See view facing page 71.

Light.—Radio mast.—A light is exhibited, at an elevation of 110 feet (33^m5), from a black, iron framework, truncated pyramidal structure, 22 feet (6^m7) in height, situated on Rās et-Tin (*Lat.* 32° 38' N., *Long.* 23° 08' E.). A radio mast stands about 2½ cables westward of this light-structure.

Golfo di Bomba.—The Golfo di Bomba lies between Rās et-Tin and Mengár Ain el-Gázala (Minquar Ain el Gatsala), about 26 miles south-south-eastward, and contains several bays sheltered from the south-westward and north-westward.

Current.—Off Rās et-Tin the current sets southward at a rate of about one knot, and between the point and Tòbruch (Tobruk), about 55 miles south-eastward, a vessel is at times set towards the coast. Close offshore the current follows the trend of the coast, from north to south, at a rate of from a quarter to half a knot, except between Punta Bomba, 13 miles southward of Rās et-Tin, and Geziret Mesráta, about 1½ miles north-eastward of Punta Bomba, where it sets north-eastward, due, probably, to the shoals in the vicinity.

50 In Marsa Umm el-Gràmi (Gharami), about 3 miles southward of Rās et-Tin, there is a south-westerly current, and in the Baia di Menelao (see page 79) the current is westerly.

Coast.—Foul ground, with a rock 5 feet (1^m5) high, extends about one mile offshore between Rās et-Tin and Scoglio Arbaa Gsur (Erba

Chart 3355.

Aksur), a rock, lying about $1\frac{1}{2}$ miles south-south-eastward of Rās et-Tin.

Between Rās et-Tin and Punta Bomba, the coast is low and sandy, with several off-lying rocks and islets. 5

Anchorage.—Marsa Umm el-Grāmi affords anchorage to vessels with local knowledge, sheltered from westerly winds, over a sandy bottom, in a depth of about 8 fathoms (14^m6), about three-quarters of a mile offshore, $2\frac{1}{2}$ miles southward of Rās et-Tin. During strong north-westerly winds a good berth will be found with Rās et-Tin 10 (*Lat.* $32^\circ 38' N.$, *Long.* $23^\circ 08' E.$) bearing 000° , and about one mile offshore.

Chart 3355, plan of Bomba anchorage.

Off-lying islets and dangers.—Scoglio La Nave (Ship rock), above water, and Umm el-Grāmi, also above water, close southward of 15 it, lie about one mile offshore, $9\frac{1}{2}$ miles south-south-eastward of Rās et-Tin. Geziret Mesrāta lies $1\frac{1}{2}$ miles north-north-eastward, and Gezira el-Uātia $1\frac{1}{2}$ miles eastward, respectively, of Punta Bomba; both these islands are low. Between all of these islets and the mainland there is shallow water. A shoal, with a depth of $2\frac{1}{4}$ fathoms 20 (5^m0) at its outer end, extends about one mile south-eastward from Gezira el-Uātia.

Isolotto (Jezirat) Bu Bārdāa (*see* view facing page 88), $3\frac{1}{2}$ miles east-south-eastward of Gezira el-Uātia, is high and rocky, and is the most prominent object in the Golfo di Bomba. Two shoals, with 25 depths of $5\frac{1}{2}$ and $6\frac{1}{2}$ fathoms (10^m1 and 11^m9) over them, lie about $1\frac{1}{2}$ and $2\frac{1}{2}$ miles north-westward, respectively, of Isolotto Bu Bārdāa.

Baia di Menelao.—Baia di Menelao is contained between Punta Bomba and Rās el-Milh, $4\frac{1}{2}$ miles southward, and is open to the eastward. Punta Bomba may be identified by a group of ruined houses on 30 it, which may be seen at a considerable distance.

A conspicuous white house stands, near the coast, about $2\frac{1}{2}$ miles northward of Punta Bomba.

Anchorage.—Anchorage may be obtained, in a depth of about 6 fathoms (11^m0), sheltered from northerly winds, about $1\frac{1}{2}$ miles 35 southward of Punta Bomba. A vessel approaching this anchorage should give Isolotto Bu Bārdāa a berth of $6\frac{1}{2}$ cables and then steer westward. If passing between Isolotto Bu Bārdāa and Gezira el-Uātia, a vessel should keep at least $1\frac{1}{2}$ miles from the latter in order to clear the shoal extending south-eastward from it. 40

On the western side of Punta Bomba (*Lat.* $32^\circ 24' N.$, *Long.* $23^\circ 08' E.$) there is a shallow lagoon, almost surrounded by low hills; although not easy of access, it affords excellent shelter to small craft in all weathers. 45

Chart 3355.

Coast.—Isola el-Marācheb (Jezirat el Marakeb), a low island, about 9 miles south-eastward of Rās el-Milh, and nearly $1\frac{1}{2}$ miles offshore, has several ruins on it. The channel between it and Mengār Ain el-Gázala, about $1\frac{1}{2}$ miles south-eastward, is encumbered with rocks and shoals. A shoal, with depths of less than 5 fathoms (9^m1) over it, 50 extends about $1\frac{1}{2}$ miles north-westward from the island. Small vessels may obtain anchorage, sheltered from easterly winds, in the bight about one mile westward of the island.

Marsa Ain el-Gázala, an inlet entered on the western side of Mengār

Chart 3355.

Àin el-Gázala, affords anchorage to small craft with a draught of less than 5 feet (1^m5) and with local knowledge, in depths of from 1½ to 2 fathoms (2^m3 to 3^m7), but the entrance is very narrow.

- 5 The coast eastward of Mengàr Àin el-Gázala is low; two prominent sandhills, covered with low scrub which becomes sparser eastward, lie close eastward of Ràs Amam, situated 7½ miles eastward of Mengàr Àin el-Gázala. A watch tower stands 10½ miles eastward of Ràs Amam, and about half a mile inland.

- 10 There is a white tower standing on a hill, 154 feet (46^m9) feet high, about 15 miles eastward of Ràs Amam and three-quarters of a mile inland. About 2 miles south-south-westward of this tower is the marabout of Sidi Mohammed (*Lat.* 32° 08' N., *Long.* 23° 45' E.), with a white dome, which is, however, visible only on a south-westerly

- 15 bearing.

Eastward of the mouth of the Uadi es-Suènet, which flows into the sea about 7½ miles eastward of Ràs Amam, several shoals, with depths of 4 to 5 fathoms (7^m3 to 9^m1), lie within a mile of the coast as far as Ràs el-Carrats (Karrats), 8½ miles eastward. A rock, with a depth of

- 20 13 feet (4^m0) over it, lies about 5½ miles west-north-westward of Ràs el-Carrats, and about one mile offshore.

In clear weather the reddish-coloured ruins of Zàuia el-Mræssas, situated 3½ miles inland and 5½ miles west-south-westward of Ràs el-Carrats, may be distinguished. The ruins of the Ridotta di Acroma

- 25 (Akroma fort), which stand at a height of 676 feet (206^m0), about 9 miles south-south-westward of Ràs el-Carrats, may also be visible. Eastward of Ràs el-Carrats the coast is low and sandy.

From Ràs el-Carrats to Marsa el-Auda, 8 miles south-eastward, the coast is steep-to, and is indented by numerous coves, of which the

- 30 most noticeable is Marsa es-Sahàl, 3½ miles south-eastward of Ràs el-Carrats. Approaching from the westward this cove can be identified by three large white patches on the coast; a remarkable cave, which has a circular mouth, rising to a height of 100 feet (30^m5) vertically from the water, lies about 2½ miles eastward of the cove.

- 35 *Charts 3355, 3657.*

Between Marsa el-Auda and Mengàr el-Mèrcheb, about 4½ miles east-south-eastward, the coast is low, but rises gradually inland to a height of about 130 feet (39^m6). The marabout of Sidi Bu Ghfeifa, white

- 40 Marsa el-Auda, forms a prominent landmark. The walls of the abandoned Forte Perrone, about half a mile south-eastward of Marsa el-Auda, may also be readily identified.

A shoal extends about 4 cables offshore from a position about half a mile eastward of Marsa el-Auda, and a 1½-fathom (2^m7) patch lies

- 45 about one mile north-north-westward of Mengàr el-Mèrcheb (*Lat.* 32° 05' N., *Long.* 24° 01' E.), and about half a mile offshore.

Radio mast.—A radio mast is situated about 3½ miles westward of Mengàr el-Mèrcheb.

Chart 3657.

- 50 **Coast.**—Depths of less than 6 fathoms (11^m0) extend about three-quarters of a mile eastward from Mengàr el Mèrcheb, and depths of less than 3 fathoms (5^m5) extend about 3 cables south-eastward from the point.

Between Mengàr el-Mèrcheb and Punta Tòbruch, about 8 cables

Charts 2158b, 449.

Chart 3657.

southward, depths of less than 6 fathoms (11^m0) extend as much as 6 cables offshore, and depths of less than 3 fathoms (5^m5) extend about a quarter of a mile offshore. A quadrangular, pyramidal tower, 31 feet (10^m1) in height, stands on Punta Tòbruch. 5

Southward of Mengàr el-Mèrcheb there is a long white sand dune, which is conspicuous in contrast to the reddish grey of the higher land to the westward.

A shoal, with a least depth of 27 feet (8^m2) over it, lies about 1½ miles north-eastward of Punta Tòbruch, and depths of less than 5 fathoms (9^m1) extend a quarter of a mile south-eastward from the point.

About 1½ miles south-south-eastward of Punta Tòbruch is Marsa Umm esc-Sciausc, an inlet about 4 cables long. There are depths of from 4 to 5 fathoms (7^m3 to 9^m1) in the centre of this inlet, but depths of less than 3 fathoms (5^m5) extend 1½ cables from its head (*Lat.* 15 32° 03' N., *Long.* 24° 01' E.). The north-western entrance point to Marsa Umm esc-Sciausc is also the southern entrance point of Mersa Tòbruch.

Obstructions.—Buoy.—Two obstructions, with depths of 34 feet (10^m4) over them, lie close together about 7 cables eastward of Punta Tòbruch; a green spherical buoy is moored midway between them.

Mersa Tòbruch.—Mersa Tòbruch is entered between Punta Tòbruch and Marsa Umm esc-Sciausc and is a spacious harbour. It is well sheltered from all winds except those from the east, which may raise a fairly heavy sea, the effect of which lessens towards the head of the harbour. A considerable sea is also experienced on the southern side with strong northerly and north-easterly winds. The bottom is sandy with patches of weed and anchors are liable to drag. The harbour is full of submerged wrecks and obstructions, the positions of which are shown on the chart. 30

The following objects are conspicuous and easily identified:—The Roman Catholic church, which is damaged, situated 1½ miles west-south-westward of Mengàr el-Mèrcheb; a water tower, standing about 2 cables south-south-eastward of the Roman Catholic church, and a pylon, situated about 1½ miles westward of the Roman Catholic church (*Lat.* 33° 05' N., *Long.* 23° 59' E.). 35

Lights.—Buoys.—Beacons.—Signal stations.—A light is exhibited, at an elevation of 163 feet (49^m7), from a black and white chequered signal station, 32 feet (9^m8) in height, about 11½ cables westward of Mengàr el-Mèrcheb. 40

A light is exhibited from the Port War Signal station, situated 3 cables east-north-eastward of Punta Tòbruch.

A can buoy, painted in red and yellow vertical stripes, and known as Fairway buoy, is moored about 5 cables southward of Punta Tòbruch.

There are numerous mooring buoys in the harbour, most of which mark wrecks and obstructions. 45

Two leading beacons, each consisting of a black and white diamond, stand on the southern shore of the harbour, about 7 cables west-north-westward of Marsa Umm esc-Sciausc; these beacons in line, bearing about 224°, lead through the entrance, north-westward of the two obstructions eastward of Punta Tòbruch, and up to the Fairway buoy. 50

Pilotage.—Pilotage is compulsory. The Pilot tug meets all vessels outside the Fairway buoy. By day the Pilot tug displays

Chart 3657.

International Code Flag "H," and, by night, an all round white light vertically over an all round red light.

Piers.—There are several piers on the northern side of Mersa Tòbruch between Punta Tòbruch and the town. About $1\frac{1}{2}$ miles westward of Punta Tòbruch, and southward of the town, is a wharf from which extend three wooden piers, numbered 2, 3, and 4; about $1\frac{1}{2}$ cables eastward of No. 4 pier is No. 5 pier, which is T-headed, and there is another pier 5 cables farther eastward.

10 No. 4 pier, which, in 1947, was in a damaged condition, is L-shaped. In 1950, the piers were reported to be in a dilapidated condition, with maximum depth alongside of 17 feet (5^m2).

There are numerous coves on the southern side of the harbour, which provide good landing places.

15 **Tòbruch.**—The town of Tòbruch (*Lat. 32° 05' N., Long. 23° 59' E.*) which, in 1948, had a population of 2,500, is situated on the northern side of the head of Mersa Tòbruch.

Port facilities.—There is a 60-ton floating crane, and on the wharf are several mobile cranes up to 3 tons capacity. There is no warehouse
20 accommodation, but plenty of stacking space. Several lighters are available.

There is a small patent slip, which was reported, in 1947, as not in working condition.

A few provisions may be obtained.

25 **Radio station.**—There is a radio station at Tòbruch. See page 15.

Communications.—There is regular steamer communication with Benghazi and Malta. Tòbruch is connected to the general telegraph and telephone systems.

Chart 3355.

30 **Coast.**—Eastward of Mersa Tòbruch the coast is rugged and intersected by numerous small streams. As far as Punta Biad, the western entrance point of Marsa Biad, about 2 miles south-eastward of Punta Tòbruch, the coast is moderately low, thence the tableland, about 300 feet (91^m4) high, slopes steeply to the sea.

35 A remarkable point, consisting of white square rocks, lies about $3\frac{1}{2}$ miles eastward of Marsa Biad; Isolotto (Jeziret) ez-Zeitún (*Lat. 32° 01' N., Long. 24° 06' E.*), close to this point, consists of a slender strip of low blackish rocks, which can only be identified from a short distance. About 8 miles eastward of Marsa Biad, there is a prominent
40 cleft in the coast.

Off-lying dangers.—**Buoy.**—A shoal, with a depth of 32 feet (9^m8) over it, lies about 4 miles east-south-eastward of Punta Tòbruch. Secca Ahal, with a least depth of 17 feet (5^m2) over it, and marked on its northern side by a red can buoy, lies $5\frac{1}{2}$ miles east-south-eastward
45 of Punta Tòbruch and $2\frac{1}{2}$ miles offshore.

Secca esc-Sceich (Sheik rocks), with a least depth of 2 feet (0^m6) over them, lie about 4 miles eastward of Isolotto ez-Zeitún and three-quarters of a mile offshore; there is foul ground between these rocks and the coast.

50 **Coast.**—**Dangers.**—Eastward of Uadi Bulilla, situated about 5 miles east-south-eastward of Isolotto ez-Zeitún, the coast becomes lower for a few miles and thence high and rugged. Uadi el-Cbasc (Kabish), $6\frac{1}{2}$ miles eastward of Uadi Bulilla, flowing through a narrow gully, is prominent.

Chart 3355.

Rās el-Cbasc (Kabish), about $1\frac{1}{2}$ miles farther eastward, is low and difficult to distinguish. A rock, awash, with a depth of $4\frac{1}{2}$ fathoms (8^m2) close eastward of it, lies about half a mile northward of Rās el-Cbasc (*Lat.* $32^\circ 00' N.$, *Long.* $24^\circ 21' E.$). 5

Eastward of Rās el-Cbasc, the coast falls less steeply to the sea; a prominent white house stands on the western side of Mersa Belafarit, about $3\frac{1}{2}$ miles eastward of the point.

Secca Belafarit (Belafarit rocks), awash, lie about 4 cables north-westward of the western entrance point of Mersa Belafarit. About 10 $3\frac{1}{2}$ miles eastward of these rocks is Isolotto (Jezirat) el-Hmara, a low and rocky islet surrounded by rocks awash; shoal water extends nearly half a mile offshore in this vicinity. About $2\frac{1}{2}$ miles farther eastward there is another islet lying close offshore at the mouth of the Uadi el-Gabr; $1\frac{1}{2}$ miles eastward of this islet the Uadi ez-Sáhal, the largest 15 stream in this district, enters the sea.

Uadi ez-Sáhal can be identified by numerous palm trees, and about one mile northward of its mouth is Secca ez-Sáhal (Sahal shoal), with a depth of 6 feet (1^m6) over it. The marabout of Sidi Hescim (Heshim) stands about $2\frac{1}{2}$ miles south-south-eastward of the mouth of Uadi 20 ez-Sáhal.

About $3\frac{1}{2}$ miles eastward of Uadi ez-Sáhal is L'Oasi Tarfaui, consisting of a dense grove of palm trees, and $1\frac{1}{2}$ miles north-eastward of the latter is Mengár Garab (*Lat.* $32^\circ 01' N.$, *Long.* $24^\circ 39' E.$), a sand dune, about 70 feet (21^m3) high, rising steeply from the sea, with 25 several dark patches of scrub on its slopes. Westward of Mengár Garab the coast consists of low white sandhills.

Between the mouth of Uadi ez-Sáhal and Mengár Bu Sceica (Bu Sheika), $6\frac{1}{2}$ miles east-north-eastward, the coast is fringed with rocks and shoals extending nearly three-quarters of a mile offshore in places. 30 A detached shoal, with a depth of 3 fathoms (5^m5) over it, lies one mile offshore about three-quarters of a mile north-westward of Mengár Bu Sceica, and foul ground extends about half a mile north-north-eastward from this point.

About three-quarters of a mile southward of Mengár Bu Sceica is 35 L'Oasi di Gianzur (Jiantsur) which is visible from seaward. Eastward of this point the coast continues sandy but of a darker colour and, about $3\frac{1}{2}$ miles from the point is Rās Uénna, on the summit of which stands a small cairn.

Collinetta di Rās Uénna, on the eastern slope of which are the ruins 40 of two buildings, stands 3 cables southward of Rās Uénna, and about $1\frac{1}{2}$ miles south-eastward of this hill is the Ridotta Lucch (Luk redoubt), a prominent white structure surrounded by stone huts.

Anchorage.—Anchorage may be obtained, by vessels with local knowledge, in depths of from $5\frac{1}{2}$ to 8 fathoms (10^m1 to 14^m6), sand and 45 weed, with good holding ground, about 6 $\frac{1}{2}$ cables eastward of Geziret Lucch (Luk), a small, low, black rock situated in Marsa Lucch (Luk), about $1\frac{1}{2}$ miles eastward of Rās Uénna (*Lat.* $34^\circ 01' N.$, *Long.* $24^\circ 45' E.$).

Coast.—Dangers.—About 6 miles east-south-eastward of Geziret Lucch is Rās el-Aora, on the summit of which stands a large cairn. 50 Marsa el-Aora lies on the eastern side of this point and at the head of the bay is a house with a turret.

A sunken rock lies about 4 cables north-eastward of Rās el-Aora, and between this point and Rās Azzáz, $5\frac{1}{2}$ miles eastward, sunken rocks

Chart 3355.

lie as far as 6 cables offshore. Rās Bu Halguma is situated about 3 miles eastward of Rās el-Aora.

A shoal, with a depth of 19 feet (5^m8) over it, lies 1½ miles north-
5 westward of Rās Azzáz and about one mile offshore.

Rās Azzáz may be identified by a group of palm trees standing behind the sand dunes south-eastward of it. A sunken reef extends about a mile eastward from the point.

Rās el-Mréisa, the western entrance point of the Gulf of Salūm, lies
10 4½ miles south-eastward of Rās Azzáz.

Charts 3355, 3356.

Light.—A light (*Lat.* 31° 58' N., *Long.* 24° 59' E.) is exhibited, at an elevation of 52 feet (15^m8), from an iron framework structure, 36 feet (11^m0) in height, situated on Rās Azzáz.

15 **Current.**—Between Rās el-Hilāl (page 75) and Rās el-Mréisa the current sets constantly south-south-eastward at variable rates depending on the direction and force of the wind, but at an average rate of one knot.

Coast.—Dangers.—About 1½ miles south-eastward of Rās Azzáz is
20 Rās el-Mnastir, and 2 miles farther south-eastward is Rās Bu Uscéica (Usheika). Depths of less than 5 fathoms (9^m1) extend as far as three-quarters of a mile offshore in the vicinity of Rās Bu Uscéica, and a 2-fathom (3^m7) patch lies about half a mile eastward of Rās el-Mnastir.

25 **Caution.**—Between Rās Bu Uscéica and Rās el-Mréisa depths of less than 5 fathoms (9^m1) extend 6½ cables offshore. It is recommended that this part of the coast should be given a wide berth.

GULF OF SALŪM.—The Gulf of Salūm is 44 miles wide at its entrance between Rās el-Mréisa and Rās Haleima; its western shore
30 is moderately high, cliffy, and bold.

Southward of Rās el-Mréisa (*Lat.* 31° 55' N., *Long.* 25° 02' E.) the coast becomes high, rugged, precipitous, broken by many gullies, and steep-to. Vessels with local knowledge may obtain good anchorage in Marsa el-Mréisa, southward of Rās el-Mréisa, sheltered from westerly
35 winds.

Chart 3355, plan of Porto Bardia.

Porto Bardia.—Porto Bardia, entered about 10 miles southward of Rās el-Mréisa, has two shallow bights at its head, the eastern one of which is foul. The harbour affords shelter except from north-easterly
40 winds; the bottom is mostly sand, and the shores are high and rocky.

In the western bight there is a masonry pier with a depth of less than 10 feet (3^m0) at its head which was, however, reported, in 1947, to be damaged. A minaret and a tower, both of which are prominent
45 objects, stand on the north-western side of Porto Bardia, about 3 and 4½ cables north-eastward, respectively, of the pier.

Anchorage.—Directions.—The best berth is in a depth of about 2½ fathoms (5^m0) in the western bight. During fine weather light land and sea breezes are experienced, the latter setting up a slight swell;
50 at night the land breeze may cause a vessel at anchor to lie across the swell, and it is advisable to lay out a sternfast to the pierhead.

Porto Bardia is not easily identified from seaward, but a group of white houses, forming the village, stand on the top of the cliffs on

Charts 2158b, 449.

Chart 3355, plan of Porto Bardia.

the northern side of the entrance and provide a useful landmark. See view facing page 88.

Charts 3355, 3356.

Coast.—Southward of Mengár Ráai Rùhah (*Lat. 31° 45' N., Long. 25° 06' E.*), the south-eastern entrance point of Porto Bardia, the coast continues high with vertical cliffs as far as Marsa er-Ràmla, about $5\frac{1}{2}$ miles southward, and is intersected by numerous streams. About 3 miles southward of Mengár Ráai Rùhah is Marsa el-Mréga, a cove which affords shelter to small craft with local knowledge except during easterly winds; there is a depth of 10 feet (3^m0) about a quarter of a cable from the head of the cove, where there is a beach. 5

Marsa er-Ràmla is a similar cove to Marsa el-Mréga, and has a depth of $5\frac{1}{2}$ fathoms (10^m1) at about three-quarters of a cable from the sandy beach at the head of the cove. Ridotta er-Ràmla, an old redoubt, standing westward of the head of the cove, is a prominent landmark. 10

An obstruction, the position of which is approximate, and the depth over which is unknown, lies about 3 miles east-south-eastward of Marsa er-Ràmla.

The boundary between Libya and Egypt reaches the coast about one mile southward of Marsa er-Ràmla. 15

Charts 2158b, 449.

CHAPTER III

NORTH COAST OF EGYPT

CLIMATE AND WEATHER.—See page 16 *et seq.*

Chart 3356.

GULF OF SALŪM (*continued*).—El Hashafa, two small islets, the higher of which has an elevation of 65 feet (19^m8), lie one cable 5 offshore, 9½ miles southward of Mengâr Râai Rûhah.

Obstruction.—An obstruction lies about 7½ miles south-south-eastward of Mengâr Râai Rûhah, and about 2½ miles offshore.

Chart 3356, plan of Salûm.

Bay of Salûm.—The bay of Salûm is entered southward of Beacon 10 point, situated about 2½ miles southward of El Hashafa. On Beacon point (*Lat. 31° 34' N., Long. 25° 11' E.*) is a stone obelisk, 30 feet (9^m1) high, and within it is a small plateau, 94 feet (28^m7) high on the north-eastern side. The cliffs end here and the coast trends westward, forming the northern side of the bay. A cone-shaped pagoda, about 15 20 feet (6^m1) in height, stands on the high ground of the point, about three-quarters of a cable westward of the obelisk.

A rocky shoal extends about three-quarters of a cable from the southern side of Beacon point.

Fort Salûm is a conspicuous old white fort, with a barracks close 20 northward of it, standing on the edge of the plateau, at an elevation of 590 feet (179^m8), about 1½ miles westward of Beacon point; these buildings are especially prominent when approaching Salûm from the eastward. Two small houses, situated near the coast, about 1½ miles south-south-westward of Beacon point, also form a prominent land- 25 mark.

Observatory point, about one mile south-westward of Beacon point, is the southern extremity of a plateau, 76 feet (23^m2) high, on which stands the coastguard and other buildings. A stone pier, with depths of from 15 to 20 feet (4^m6 to 6^m4) alongside, and with two red warping 30 buoys near its head, extends south-westward from the point, but it is only suitable for small vessels in fine weather. A distilling plant stands at the root of this pier.

A stone jetty is situated on the western shore of the bay, about 3 cables south-south-westward of Observatory point.

35 A few supplies can be obtained from the village.

Chart 3356, plan of Bay of Salûm.

The coast southward of the small bay lying westward of Observatory point (*Lat. 31° 34' N., Long. 25° 10' E.*) is low and sandy. Yorke

Charts 2606, 2158b, 449.

Chart 3356, plan of Bay of Salūm.

patches, lying about 3 cables southward of Observatory point, and the same distance offshore, consist of several rocks, with depths of 18 feet (5^m5) over them.

In the vicinity of Salūm the water is exceptionally clear, the bottom being visible at a depth of 17 fathoms (31^m1) in smooth water.

Anchorage.—Depths.—In the approach to the Bay of Salūm the depths decrease gradually from 9 fathoms (16^m5) southward of Beacon point to 6 fathoms (11^m0) eastward of the pier, and anchorage may be obtained as convenient, with fair holding ground of sand and weed. Small vessels may obtain good anchorage, in a depth of 4½ fathoms (8^m7), sand and weed, one cable south-south-eastward of the pier.

North-westward of the pier is a well-sheltered bay, with depths of from 10 to 15 feet (3^m0 to 4^m6), on the north-eastern side of which is a rubble breakwater, 500 feet (152^m4) long, which affords protection for lighters in depths of from 4 to 7 feet (1^m2 to 2^m1). There is a small wooden jetty with a depth of 4 feet (1^m2) at its head.

Chart 3356.

The Great Libyan plateau (Hajjaj el Aqaba), the north-eastern edge of which ends near Salūm, thence runs in a south-easterly direction, gradually receding from the coast. Near the coast it varies from 600 to 640 feet (182^m9 to 195^m1) in elevation, and is intersected by numerous short water courses. The summit is very flat, the soil consisting of sand and stones, and it is sparsely covered with very low scrub, and with occasional patches of rudimentary cultivation.

The coast between the southern end of the Bay of Salūm (Lat. 31° 30' N., Long. 25° 12' E.) and Sidi Barrāni, about 38 miles eastward, is low and sandy, with occasional rocky points, and is bordered by rocks in many places; as far as Rās Seiyāda, 14½ miles east-south-eastward of Beacon point, it is fronted by a salt marsh. A ridge of white sandhills backs the coast, the highest for the first 17 miles having an elevation of 102 feet (31^m1).

Between the inland plateau and the coast, there is a plain which is considerably cultivated; the villages are mostly situated close to the sea, where a break in the coastline forms a safe harbour for small craft. The width of this plain varies from a few hundred yards in the western part to as much as 20 miles in the eastern part, as the plateau recedes from the sea.

For a distance of 17 miles eastward of Salūm depths of less than 5 fathoms (9^m1) extend about 2 miles offshore in places. Rās Seiyāda is low and rocky, with a rock 5 feet (1^m5) high off it.

Between Rās Seiyāda and Sidi Barrāni, about 24 miles east-north-eastward, the coast is backed by hills, rising to an elevation of 210 feet (64^m0), from 2 to 3 miles inland. There is a prominent coastguard station at Sidi Barrāni.

About 2 cables eastward of Sidi Barrāni lighthouse there is a small cove, 40 yards (36^m6) in width, which is fringed with rocks but which can be used as a boat landing. There is a small pier, with sheer legs and a jib, on the western side of the cove. A reef, awash, extends about one cable westward of the eastern entrance point of the cove and is the only danger in the approach. The cove affords fair shelter from a northerly swell.

Anchorage may be obtained off Sidi Barrāni, in a depth of 9 fathoms

Charts 2606, 2158b, 449.

Chart 3356.

(16^m5), about 2 cables northward of the above-mentioned cove, but it is entirely exposed.

The land in this vicinity rises gradually from the coast and there is a prominent beacon, consisting of a black post, surmounted by a spherical cage, 18 feet (5^m5) in height, situated eastward of the light-house and about half a mile inland.

Caution.—In 1945, it was reported that when approaching Sidi Barrâni from northward, soundings between the 100-fathom (182^m9) line and the shore were not in agreement with those shown on the chart.

Light.—A light (*Lat.* 31° 37' N., *Long.* 25° 55' E.) is exhibited, at an elevation of 49 feet (14^m9) from a black square iron tower, 8 feet (2^m4) in height, at Sidi Barrâni. This light was extinguished in 1945.

COAST.—The coast from Sidi Barrâni to Râs Abu Laho, about 57 miles east-south-eastward, is low and backed by small sandhills, with rocky reefs and foul ground, which are steep-to, extending from it; there are depths of 100 fathoms (182^m9) less than a mile outside these reefs, in places.

About midway between Sidi Barrâni and Râs Abu Laho, and about 4 miles inland, the hills rise to an elevation of 253 feet (77^m1) and, about 3½ miles west-south-westward of Râs Abu Laho, there is a hill, 400 feet (121^m9) high.

Off-lying dangers.—Taifa rock, about 16 miles eastward of Sidi Barrâni and 2½ miles offshore, is 5 feet (1^m5) high, and steep-to, with sunken rocks around it. Foul ground is charted nearly 5 miles westward, and 7 and 15 miles east-south-eastward, of Taifa rock. In 1945, it was reported that the depths eastward of the rock were very irregular, varying from 5 to 20 fathoms (9^m1 to 36^m6) within a short distance of the rock. A shoal, with a depth of 4 fathoms (7^m3) over it, and which has not been examined, was reported, in 1938, about 2½ miles north-westward of Taifa rock.

Chart 3356, plan of Ishaila rocks.

About 21 miles east-south-eastward of Taifa rock and nearly 1½ miles offshore is Gezirat (Jezirat) Ishaila, about 58 feet (17^m7) high, from which reefs extend about 1½ miles west-south-westward. Anchorage may be obtained, in case of emergency, in a depth of 16 fathoms (29^m3), sand, about 3 cables southward of the islet. Caution is necessary as this vicinity has been only cursorily surveyed.

About 1½ miles east-south-eastward of Gezirat Ishaila (*Lat.* 31° 31' N., *Long.* 26° 38' E.) is a detached reef, and patches of reef extend for about 10 miles eastward, parallel to the coast.

Coast.—Râs Abu Laho (ancient *Naten*) is moderately high and cliffy; a range of hills, about 600 feet (182^m9) high, extends about 8 miles southward from it.

A rocky bay, the shores of which are high, lies between Râs Abu Laho and Râs Umm el-Rakham (ancient *Zephyron prom*), about 3½ miles south-eastward.

Chart 3356, plan of Mersa Umm el-Rakham.

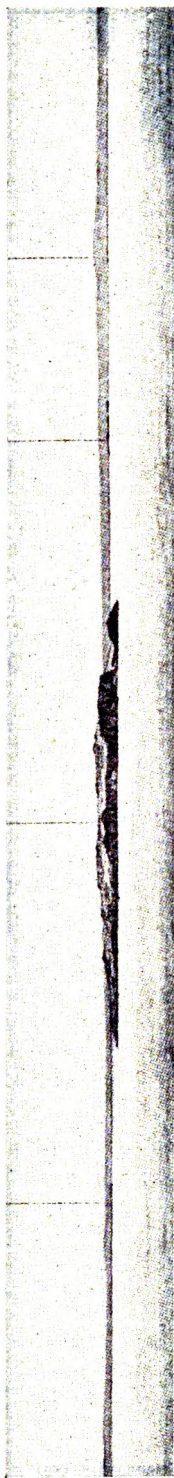
Mersa Umm el-Rakham.—Mersa Umm el-Rakham, an inlet with low shores, is situated on the eastern side of Râs Umm el-Rakham; it affords shelter from northerly and westerly winds inside a broken line of rocky reefs extending about 4 miles eastward from the cape. Umm

To face page 88.

Rās el-Milh.

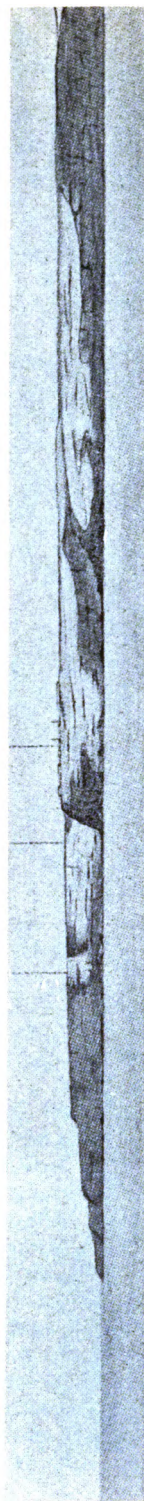
Isolotto Bu Bārdaa,
bearing 270°, distant $1\frac{1}{2}$ miles.

Gestre el-Yādiā.



Isolotto Bu Bārdaa from eastward.

Entrance
to port. Village



Entrance to Port Bardia from northward.
(Originals dated 1931.)

To face page 89.

Rās el-Kanâyis,
bearing 236°, distant 6½ miles.



Rās Alum el-Rum.

Rās el-Kanâyis from north-eastward.
(Original dated 1862.)

Arab's tower,
bearing 181°,
distant 6 miles.

Abu-Sir

Kôm el-Nugus.



Arab's tower and landmarks in the vicinity from northward.
(Original dated 1862.)

Chart 3356, plan of Mersa Umm el-Rakham.

el-Rakham reef, about $1\frac{1}{2}$ miles eastward of the cape, is partly above water.

Anchorage may be obtained, in depths of from 8 to 10 fathoms (14^m6 to 18^m3), sand, about 4 cables south-eastward of the highest part of Umm el-Rakham reef, but it is dangerous to approach without sending a boat to sound ahead.

Chart 3356.

Coast.—The coast between a point $4\frac{1}{2}$ miles south-eastward of Rās Umm el-Rakham and Point Labeit, a low point $4\frac{1}{2}$ miles farther eastward, is cliffy and bordered by rocks.

Chart 3567, plan of Mersa Matrûh.

Mersa Matrûh.—Mersa Matrûh is contained between Point Labeit and Matrûh point, about 7 cables eastward, is an indentation completely sheltered from seaward by reefs extending about one cable eastward from Point Labeit and half a mile westward from Matrûh point (*Lat.* $31^\circ 22' N.$, *Long.* $27^\circ 14' E.$), leaving a narrow entrance between them. The latter reef, known as Matrûh reef, has on it a number of above-water rocks, and of these, White rock, 9 feet (2^m7) high, situated 2 cables westward of Matrûh point, is conspicuous; there are two boat passages through this reef which can be used in fine weather.

Point Labeit is 5 feet (1^m5) high, and a small rock, 3 feet (0^m9) high stands on the reef close east-south-eastward of the point. A conspicuous rock, known as Pinnacle rock, 34 feet (10^m4) high, lies about $2\frac{1}{2}$ cables west-north-westward of Point Labeit; Square rock, 19 feet (5^m8) high, is situated about three-quarters of a cable south-eastward of Pinnacle rock.

The southern shore consists of a range of sandhills, from 20 to 30 feet (6^m1 to 9^m1) high, with scrub and some palm trees, and close to it stands the village of Matrûh, the residence of the Governor of the western desert, whose house is situated about $8\frac{1}{2}$ cables south-south-eastward of Point Labeit.

The western shore, with the exception of the rocky point terminating in Point Labeit, is sandy and liable to inundation. It separates the inlet from a lagoon, which extends westward for about $2\frac{1}{2}$ miles, with depths of from 3 to 5 fathoms (5^m5 to 9^m1) in it. This lagoon appears to have been extensively used by the Romans as a harbour, and numerous ruins and, in places, remains of aqueducts, wharves, and piers, are still visible.

The ruins of the ancient town of Matrûh, known as Old Matrûh, are situated in an oasis at the western end of the lagoon. The entrance to the lagoon is close southward of Point Labeit, but there is only a depth of 2 feet (0^m6) in it and it is liable to alteration in strong winds.

Landmarks.—On approaching Mersa Matrûh the following objects are conspicuous and easily identified:—Pinnacle and White rocks, respectively, already mentioned; the red building of the Lido hotel, situated about $6\frac{1}{2}$ cables southward of Point Labeit; the minaret of Sidi Awam mosque, 114 feet (34^m8) high, about $1\frac{1}{2}$ cables south-eastward of the Lido hotel; the Bank building (*Lat.* $31^\circ 21' N.$, *Long.* $27^\circ 14' E.$), situated about $6\frac{1}{2}$ cables eastward of Sidi Awam minaret; another minaret, about $1\frac{1}{2}$ cables south-south-eastward of the Bank; two chimneys, about $3\frac{1}{2}$ cables east-north-eastward of the Bank; four radio masts, about 70 feet (21^m3) high, about $3\frac{1}{2}$ cables southward

Charts 2606, 2158b, 449.

Chart 3567, plan of Mersa Matrūh.

of the Bank; and a water tower, standing about $1\frac{1}{2}$ miles west-south-westward of the radio masts.

On nearer approach the following other objects are prominent and readily identified:—The entrance leading beacons, three in number, the northernmost of which is situated about three-quarters of a cable north-westward of the Lido hotel; the Port Office flagstaff, 77 feet (23^m5) high, standing $3\frac{1}{2}$ cables eastward of the Bank, and the Rest house, with a flagstaff, on the skyline, about 6 cables southward of the Bank.

Harbour.—The harbour is situated at the eastern end of the inlet, and is separated from the sea by a rocky spit, about 7 cables long, rising to a height of 69 feet (21^m0) at its eastern end, which terminates in Matrūh point (*Lat. $31^\circ 22' N.$, Long. $27^\circ 14' E.$*). A rubble break-water, about 2 cables south-eastward of Matrūh point, extends about $2\frac{1}{2}$ cables south-westward from the southern side of the rocky spit mentioned above, and gives additional protection from the westward. The eastern and southern shores of the harbour are flat and sandy and liable to inundation; the former bounds the shores of the westernmost of a chain of salt lagoons which extend eastward for about $5\frac{1}{2}$ miles.

Harbour point, the southern entrance point of the harbour, is sandy and remarkably steep-to; in recent years it has extended northward.

Sea level.—During northerly winds the water level in the harbour may rise about 3 feet (0^m9) above the datum of the soundings.

Dangers.—Buoy.—A large area of shallow water, extending southward from Matrūh reef, occupies the central part of the inlet; it is encumbered with rocks, over which there are depths of from 2 to 3 feet (0^m6 to 0^m9), and of which the most important are Jaafar, Senussi, and Askeri rocks, on which the sea breaks heavily even with moderate winds.

Nury rock, with a depth of 5 feet (1^m5) over it, lies about $3\frac{1}{2}$ cables west-north-westward of White rock.

Sponge patch, with a depth of 19 feet (5^m8) over it, lies about $3\frac{3}{4}$ cables west-south-westward of White rock.

Rocks lie within nearly one cable of the southern shore of the inlet. About $5\frac{1}{2}$ cables westward of White rock there is a rock with a depth of 8 feet (2^m4) over it; a black can buoy is moored about half a cable south-south-eastward of this rock.

Caution.—A wind sets across the harbour entrance from west to east during the summer months, and from east to west in the winter. It is at all times necessary to close the harbour in heavy weather owing to danger at the entrance.

Channel. — Lights. — Beacons. — Buoys. — A channel, partly formed by dredging, with a least depth of 19 feet (5^m8) in it, and a least width at the entrance of about 100 yards (91^m4), leads westward and southward of the central shoal area to the anchorage eastward of the breakwater. A depth of 18 feet (5^m5) lies on the northern side of the channel, about $3\frac{3}{4}$ cables east-north-eastward of Sidi Awam mosque (*Lat. $31^\circ 21' N.$, Long. $27^\circ 14' E.$*).

Two pole beacons, painted red and white and fitted with reflectors, standing on the outer rocks, mark the entrance; that on the eastern side is surmounted by a rectangle and that on the western side by a triangle.

Charts 2606, 2158b, 449.

Chart 3567, plan of Mersa Matrôh.

Three leading beacons, painted in black and white horizontal bands, in line, bearing 210° , lead through the entrance; the front beacon stands about $2\frac{1}{4}$ cables north-westward of Sidi Awam mosque, with the middle and rear beacons about $1\frac{1}{2}$ and $9\frac{1}{4}$ cables, respectively, south-south-westward of it. Thence three pairs of leading beacons mark the centre of the channel which, in line, bear 169° , 129° , and 090° , respectively. Each pair consists of pole beacons, surmounted by rectangles, diamonds, and triangles respectively.

Lights are exhibited, when required, from each of the leading beacons.

Eight buoys, painted yellow, and numbered 1 to 8 from seaward, mark the eastern and northern sides of the channel. Two black mooring buoys, one on either side of the channel, are moored about $1\frac{1}{4}$ cables north-eastward and $2\frac{1}{4}$ cables north-north-eastward of Sidi Awam mosque.

Anchorage.—Directions.—Obstructions.—The best berth is at the mooring buoy about $1\frac{1}{4}$ cables northward of Drama point, situated about $1\frac{1}{4}$ cables south-eastward of Harbour point, where there is a depth of about 23 feet (7^m0), mud over sand, with the ship's head west and a stern anchor out; the holding ground is fair. In fine weather a vessel can anchor in the deep water northward of Harbour point with her stern secured to the mooring buoy.

On approaching the entrance a vessel should bring the three leading beacons, already described, in line, bearing 210° , as soon as they can be distinguished, in order to steady her on the correct course; the entrance is only half a cable wide and an appreciable set across it may be experienced in either direction. When inside the channel she should keep the various leading beacons in line, finally steering a course midway between the head of the breakwater and Harbour point (*Lat. $31^{\circ} 22' N.$, Long. $27^{\circ} 15' E.$*).

A submerged obstruction lies about half a cable south-eastward of Harbour point and close offshore; there are two ruined jetties about $1\frac{1}{4}$ cables south-eastward of the point.

Some submerged blocks, which are indicated on the chart, lie about $1\frac{1}{4}$ cables south-eastward of Harbour point.

An area north-eastward of Drama point, indicated by pecked lines on the chart, has been dredged to a depth of 20 feet (6^m1).

Matrôh.—The population of the village consists largely of Greeks, who trade with the Bedouin tribesmen and local herdsmen, besides the Egyptians attached to the Government services.

A few fresh provisions may be obtained. There is regular steamer communication with Alexandria. Matrôh is connected to the Egyptian railway system and to the general telegraph system.

Chart 3356.

Coast.—Lights.—Dangers.—The coast from Matrôh point to Râs Alam el-Rûm, about $5\frac{1}{2}$ miles eastward, is rocky and fronted by off-lying rocks. Râs Alam el-Rûm (ancient *Parætonium prom*) is the termination of a spur, 135 feet (41^m1) high, from the apex of two ranges of hills which run westward and southward from the point.

A light for the use of aircraft is occasionally exhibited from a position about 3 miles southward of Matrôh point (*Lat. $31^{\circ} 22' N.$, Long. $27^{\circ} 14' E.$*).

A light is exhibited, at an elevation of 145 feet (44^m2), from a white

Chart 3356.

square iron tower with black bands, 8 feet (2^m4) in height, on Rās Alam el-Rûm.

Chart 3567, plans of Rās Alam el-Rûm anchorage and Mersa el Fallah.

- 5 **Mersa el Fallah and Rās Alam el-Rûm anchorage.—Lights.—**
Beacons.—Mooring buoy.—A cove, known as Mersa el Fallah, lies about three-quarters of a mile south-south-eastward of Rās Alam el-Rûm lighthouse; it can be identified by some conspicuous salt stacks close northward of it; a jetty extends nearly half a cable south-
 10 south-westward from its northern entrance point; lights are occasionally exhibited from the north-eastern corner and the head of the jetty. There are depths of from 3 to 6 feet (0^m9 to 1^m8) in the cove and a rocky shoal, with depths of less than 6 feet (1^m8) over it, lies about half a cable south-eastward of the head of the jetty; a beacon, from which
 15 a light is occasionally exhibited, marks the northern end of the shoal and another beacon stands in the cove about half a cable westward of it.

Chart 3567, plan of Rās Alam el-Rûm anchorage.

- A beacon stands on the coast about $6\frac{1}{2}$ cables south-eastward of Rās
 20 Alam el-Rûm lighthouse, with which it is in line bearing 318° ; two beacons, about $1\frac{1}{2}$ cables apart and which are in line bearing 270° , stand near the coast a short distance southward of Mersa el Fallah; there is a mooring buoy at the junction of these two transits.

- There is anchorage, in depths of from 4 to 8 fathoms (7^m3 to 14^m6),
 25 sand and rock, within a radius of about 2 cables from the mooring buoy.
Chart 3356.

- Coast.**—The coast between Rās Alam el-Rûm and Rās el Kanâyis, about 27 miles east-south-eastward, is indented by several sandy bays, and backed by hills which rise to an elevation of 548 feet (167^m0), about
 30 18 miles south-eastward of the former point. Mersa Abu Hashafa (Hashaifa) is entered between Rās Alam el-Rûm and Rās Hawala, 14 miles south-eastward; the latter point is fringed with sunken rocks.

- Medina reefs extend from 2 to 8 miles south-south-eastward of Rās Alam el-Rûm (*Lat.* $31^\circ 22' N.$, *Long.* $27^\circ 21' E.$) and from 2 to 3 miles
 35 offshore.

Chart 3356, plan of Mersa Abu Hashafa.

Mersa Abu Hashafa.—Rās Abu Hashafa (ancient *Laodamantius prom*), about 4 miles eastward of Rās Hawala, is a bluff, white headland.

- There is a small cairn on the extremity of Rās Abu Hashafa; the
 40 point is not conspicuous.

A shoal, with a depth of 9 feet (2^m7) over its seaward end, extends about $1\frac{1}{2}$ cables northward from a position about 3 cables westward of Rās Abu Hashafa.

- Depths of 10 fathoms (18^m3), or less, extend about $2\frac{1}{2}$ cables north-
 45 ward and 3 cables north-eastward of the cape, and a rocky reef, with a depth of 6 feet (1^m8) over its seaward end, extends about $2\frac{1}{2}$ cables north-eastward.

- Abu Hashafa island, about $2\frac{1}{2}$ cables south-eastward of the cape, is surrounded by a reef, and a spit, with a depth of 6 feet (1^m8) over its
 50 outer end, extends about $3\frac{1}{2}$ cables east-south-eastward from the island.

In 1939, the summit of Abu Hashafa island, at the eastern end, was marked by a white pole beacon, 6 feet (1^m8) in height, surmounted by a black cone.

Charts 2606, 2158b, 449.

Chart 3356, plan of Mersa Abu Hashafa.

Anchorage may be obtained by vessels with local knowledge, sheltered from north-westerly and westerly winds, about 2 cables southward of the eastern end of the island, in a depth of 6 fathoms (11^m0), sand with patches of rock, but the holding ground is not 5 good.

Chart 3356, plan of Mersa Baqqûsh.

Mersa Baqqûsh.—Mersa Baqqûsh (ancient *Zygren*), situated about 1½ miles south-eastward of Râs Abu Hashafa (*Lat.* 31° 12' N., *Long.* 27° 38' E.), is a small harbour, available for small craft with local 10 knowledge. There are depths of from one to 3 fathoms (1^m8 to 5^m5), lying inside a line of rocks which extends westward from Hashafet el-Nagith, a large black rock, showing clearly against the sandhills behind, and connected to the mainland by a narrow neck. There are 15 three narrow passages through the line of rocks into the harbour, in the eastern one of which there is a depth of 3 fathoms (5^m5).

Chart 3356.

Coast.—There is a remarkable gap in the land a short distance inside Râs el Kanâyis (*Lat.* 31° 15' N., *Long.* 27° 51' E.), which appears as an island from a distance of about 10 miles on some bearings; nearer 20 the point the black rocks bordering it show up against the white sandhills. See view facing page 89.

The Gulf of Kanâyis is the bight formed by the coast which trends 8½ miles southward from Râs el Kanâyis and thence 27 miles eastward to Râs el Dab'a. A rock, with a depth of 4 fathoms (7^m3) over it, lies 25 about 2 miles south-south-eastward of Râs el Kanâyis, and about three-quarters of a mile offshore.

El Homfis rocks, consisting of two above-water rocks, the larger of which is 15 feet (4^m6) high, and a rock awash, on which the sea breaks, about half a cable south-eastward, lie about 6½ miles south-south- 30 eastward of Râs el Kanâyis, and about 1½ miles offshore; there are depths of 4 and 6 fathoms (7^m3 and 11^m0) inside these rocks.

About 6 miles east-south-eastward of El Homfis rocks is Hashafat el Qutt islet (ancient *Pidonía*), situated in the middle of Gharqan reef, which connects it with the coast and from which it extends one mile 35 eastward; the eastern end of Gharqan reef is about one mile offshore, with depths of from 3 to 5 fathoms (5^m5 to 9^m1) between the reef and the mainland.

The stretch of coast which extends from 4 to 8 miles eastward of Gharqan reef consists of a line of remarkable black cliffs, with hills 40 rising to an elevation of 220 feet (67^m1) close westward of Râs Abu Girâb (*Lat.* 31° 06' N., *Long.* 28° 10' E.).

Râs Abu Girâb lies 7½ miles eastward of Hashafat el Qutt, and about 6 miles farther eastward is a cliff, 85 feet (25^m9) high and about 1½ miles long. About 2 miles eastward of Râs Abu Girâb is Mersa 45 Abu Samra and, about 2 miles farther eastward, is Abu Samra reef, with depths of less than 6 feet (1^m8) over it, and nearly connected with the mainland south-westward by a spit, with a depth of 3 fathoms (5^m5) over it.

On Râs el Dab'a (ancient *Zephyrium*) there is a coastguard watch 50 tower; a reef extends, about half a mile offshore, for a distance of about 3½ miles westward from Râs el Dab'a.

The railway connecting Matrûh with Alexandria runs along all this part of the coast at distances of from one to 4 miles inland.

Charts 2606, 2158b, 449.

Chart 3356.

ARABS GULF.—Arabs gulf is the large indentation between Rās el Dab'a and Alexandria, about 75 miles eastward. Between Rās el Dab'a and Rās Gibeisa, 18 miles east-south-eastward, the coast is fringed by reefs. A rocky reef, with depths of 3 fathoms (5^m5), or less, over it, extends about a mile north-eastward and eastward from a point lying about 2½ miles south-eastward of Rās el Dab'a.

Tannûm reef, nearly awash, extends about 1½ miles from Rās Abu el-Gurûf, situated 9 miles east-south-eastward of Rās el Dab'a; there is a depth of 4 fathoms (7^m3) about three-quarters of a mile eastward of the reef, and there are depths of 100 fathoms (182^m9) about 1½ miles north-eastward. Reefs extend about one mile from a point about 6 miles east-south-eastward of Rās Abu el-Gurûf (*Lat.* 31° 02' N., *Long.* 28° 36' E.).

Rās Gibeisa, on which there is a coastguard post, is fringed by rocks, which extend three-quarters of a mile northward. The small mosque of Sidi Abd el Rahman, situated 1½ miles south-westward of Rās Gibeisa, is the only prominent object on this part of the coast.

A 3¼-fathom (6^m4) patch lies about 2 miles eastward of Rās Gibeisa, and Gibeisa reef, awash, lies about 3¼ miles east-south-eastward of the point, and one mile offshore.

Anchorage.—Anchorage may be obtained, sheltered from westerly winds, in depths of from 4 to 5 fathoms (7^m3 to 9^m1), with Rās el-Shaqîq, situated 4 miles south-eastward of Ras Gibeisa, bearing 299°, distant 1½ miles.

Good anchorage may be obtained, in a depth of 6 fathoms (11^m0), during offshore winds, about 2½ miles northward of El' Imayid, formerly the site of a conspicuous tower, destroyed in 1944, situated 20 miles east-south-eastward of Rās el-Shaqîq.

Coast.—The coast between Rās el-Shaqîq and El' Imayid is bordered by rocks and shoals. El-Shaqîq reef, about 5 miles south-eastward of Rās el-Shaqîq, has a number of rocks on it with depths of less than 6 feet (1^m8) and, in this vicinity, depths of 3 fathoms (5^m5) extend 2½ miles offshore.

Tell Alam el-Milh, a hill, 69 feet (21^m0) high, is situated about 12½ miles south-eastward of Rās el-Shaqîq, and half a mile inland. El Shammama banks, with a least depth of one fathom (1^m8) over them, extend 4 miles northward from the coast about 1½ miles eastward of Tell Alam el Milh, and eastward to a position about 1½ miles offshore northward of El' Imayid (*Lat.* 30° 50' N., *Long.* 29° 21' E.).

About 5 miles southward of El' Imayid is a range of hills of which Gebel Khasm el' Eish, the highest, has an elevation of 331 feet (100^m9).

The coast between El' Imayid and Abu Sir hill, about 18 miles east-north-eastward, consists of a sandy beach, with low hills close inland, fronted for nearly its whole extent by numerous reefs and foul ground.

Abu Sir hill, about three-quarters of a mile inland, is about 120 feet (36^m6) high, and on it is the ancient Egyptian walled town of *Taposiris*, Arab's tower, or Arab-guelli, the remains of a Roman lighthouse, the top of which is about 185 feet (56^m4) high, is prominent, and stands on a hill close north-eastward of Abu Sir. See view facing page 89.

Kôm el Nugus, a prominent bare hill, about 185 feet (56^m4) high, lies about three-quarters of a mile north-eastward of Arab's tower, and is the highest land in the vicinity.

Off-lying dangers.—Medina reef, awash at its southern part, lies

Chart 3356.

with its outer edge, over which there are depths of from 2 to 3 fathoms (3^m7 to 5^m5), about 5 miles offshore and 7 miles north-eastward of El' Imayid. There are two 3-fathom (5^m5) patches between the reef and the coast, and another about one mile east-north-eastward of the reef. 5

Victorieuse rock (*Lat.* $30^\circ 59' N.$, *Long.* $29^\circ 24' E.$), nearly awash, is charted about 7 miles north-westward of Arab's tower.

Abu Sir reef, with depths of less than 5 fathoms (9^m1) over it, extends 6 miles in an east-north-easterly direction from a position about $3\frac{1}{2}$ miles north-westward of Arab's tower; a patch, nearly awash, lies $1\frac{1}{2}$ miles within its western end, and a rock, with a depth of less than 6 feet (1^m8) over it, is charted about $2\frac{1}{4}$ miles within its eastern end. From the eastern end of Abu Sir reef, a line of reefs, over which there are depths of less than 5 fathoms (9^m1), extends from half a mile to about $1\frac{1}{2}$ miles offshore, and joins the coast south-westward of Fort 15
Abbassia, 18 miles north-eastward of Arab's tower.

A rocky islet, 14 feet (4^m3) high, and a rock, 7 feet (2^m1) high, close north-eastward of it, lie about three-quarters of a mile offshore, $5\frac{1}{2}$ miles south-westward of Fort Abbassia. Two rocks, with depths of less than 6 feet (1^m8) over them, lie close south-westward of the 20
rocky islet.

Buoys.—Two pillar buoys, each surmounted by a cage topmark, about $1\frac{1}{2}$ miles apart, are moored about 10 miles north-westward of Arab's tower. A black conical buoy, surmounted by a globe, is moored about 11 miles north-westward of Fort Abbassia. 25

Charts 2681 and 3356.

Coast.—The coast between Arab's tower and Fort Abbassia is low and sandy, but about $1\frac{1}{2}$ miles inland there is a line of barren hills, about 100 feet (30^m5) high, which runs parallel to the coast, terminating close to Mex high lighthouse (*Lat.* $31^\circ 09' N.$, *Long.* $29^\circ 51' E.$), 4 miles 30
eastward of Fort Abbassia. On the summit of this line of hills are several old square towers, 20 feet (6^m1) in height; a conspicuous pylon stands about $4\frac{1}{2}$ miles south-westward of Fort Abbassia.

About 6 miles inland, south-eastward of Arab's tower and parallel with the coast, there is a range of hills, about 15 miles long, which rise 35
to an elevation of about 260 feet (79^m2).

Directions.—A vessel navigating Arabs gulf should not proceed into depths of less than 25 fathoms (45^m7) between Rās el Dab'a and Rās el-Shaqîq, and caution is necessary in the vicinity of Tannum reef, which is almost steep-to on its northern side. 40

Between Rās el-Shaqîq and Medina reef a vessel should keep outside the 10-fathom (18^m3) line, and thence to Alexandria in depths of over 20 fathoms (36^m6).

Caution.—There is reported to be a strong indraught into Arabs gulf at times and, in consequence, a vessel should sound frequently. 45

Charts 3119, 243.

PORT OF ALEXANDRIA.—General remarks.—The port of Alexandria is situated in the north-eastern portion of a bay, which is entered between the point, on which stands Fort Abbassia, and Rās el-Tîn, about 5 miles north-eastward. A line of reefs and shallow 50
water, about one mile wide between the 6-fathom (11^m0) lines, extends across the bay, with a belt of depths of from 7 to 10 fathoms (12^m8 to 18^m3), about 6 cables wide, inshore of it. There are four channels

Charts 2606, 2158b, 449.

Charts 3119, 243.

through the reefs, namely :—Marabut, Great, Boghaz, and Corvette passes, respectively, from the westward.

El' Agami island, with its old fort, and Gezirat el Akrash (Agrash),
5 lie on reefs which extend about half a mile north-eastward from Fort Abbassia.

Foul ground and shoal water, with rocks above and below water, extends about one and a quarter miles south-south-westward from Fort Abbassia and includes the following, named in order south-south-
10 westward from the fort :—Gezirat el Kinisiya, Fresia rock, Sawahil rock, Long rock, 10 feet (3^m0) high, The Button, 8 feet (2^m4) high, Violet rock, El Bowa, 10 feet (3^m0) high, and Salama reef (*Lat.* 31° 08' N., *Long.* 29° 46' E.).

A boat passage, known as Agami pass, lies between Fort Abassia
15 and El Agami island, and there is a passage, known as Main pass, between The Button and Violet rock.

El Dikheila, formerly Mersa el Kanat, is a village situated in the south-western portion of the bay, off which is a small breakwater of boulders affording some refuge to small boats.

20 Mex is a village, situated on the south-western outskirts of Alexandria, 1½ miles north-eastward of El Dikheila. There are two small harbours at Mex ; El Fransawiya harbour, the westernmost, has a breakwater and quays and is connected to the State railway system. Bâb el-'Arab bay, the easternmost, about half a mile north-eastward of
25 El Fransawiya harbour, is used mainly by fishing craft and small boats. Neither harbour can be used in heavy north-westerly weather. Khandag Bâb el 'Arab, the channel from Lake Maryut, enters the sea in Bâb el-'Arab bay.

Alexandria harbour is the area contained within the Outer and
30 Quarantine breakwaters. It is further divided into the Outer and Inner harbours by the Coal mole.

Limits of Port.—The Administrative limits of the Port of Alexandria are within a line drawn from Fort Abbassia (*Lat.* 31° 09' N., *Long.* 29° 47' E.) to about 2 cables outside Boghaz pass, and thence
35 to Râs el-Tîn.

Submarine cables. — Prohibited anchorage. — Anchorage is prohibited within an area in the approaches to Alexandria, indicated by pecked lines on the chart, enclosed by the arc of a circle with Great Pass beacon as centre and a radius of about 8 miles. *See also page 13.*

40 **Approach.**—Approaching from north-westward Râs el-Tîn lighthouse is usually first sighted, and the following other objects are conspicuous and easily identified :—The dome of St. Mark's college, 166 feet (50^m6) high, situated about 3 miles east-north-eastward of Râs el-Tîn lighthouse ; El Anfushi minaret standing 1½ miles north-
45 eastward of Râs el-Tîn lighthouse ; the dome of Râs el-Tîn palace, 153 feet (46^m6) high about 4½ cables north-eastward of Râs el-Tîn lighthouse ; two radio masts, each 330 feet (100^m6) high, situated about 1½ cables north-eastward and 3 cables north-north-eastward, respectively, of Râs el-Tîn lighthouse ; Fort Napoleon flagstaff, 198 feet
50 (59^m3) high, standing about 1½ miles eastward of Râs el-Tîn lighthouse ; Stagni tower, 169 feet (51^m1) high, about 1½ miles south-south-eastward of Râs el-Tîn lighthouse ; Kamaria Signal station, with a flag-staff 146 feet (44^m5) high, situated about 1½ miles southward of Râs el-Tîn lighthouse ; Mex high lighthouse, 124 feet (37^m8) high, standing

Charts 2606, 2158b, 449.

Charts 3119, 243.

about $8\frac{1}{2}$ cables south-south-westward of Kamaria Signal station ; Fort Skeffakhara, with a flagstaff, 131 feet (39^m9) high, situated 4 cables west-south-westward of Mex high lighthouse ; Abu Nagi minaret, 104 feet (31^m7) high, standing $2\frac{1}{2}$ miles south-westward of Mex high lighthouse ; a red Hangar, situated $6\frac{1}{2}$ cables westward of Abu Nagi minaret, and a tower, 49 feet (14^m9) high, standing on El' Agami island (*Lat.* $31^{\circ} 09' N.$, *Long.* $29^{\circ} 47' E.$), $1\frac{1}{2}$ miles north-westward of the red Hangar.

A vessel approaching is sometimes set eastward, and El-Burg fort, 10 Abu Qir (Chart 2681), about $12\frac{1}{2}$ miles north-eastward of Ras el-Tin lighthouse, has been mistaken for the fort on El' Agami island to which it bears some resemblance. Nelson island, $2\frac{1}{2}$ miles north-eastward of Burg fort, however, shows like a saddle-backed hill, and the land westward of Burg fort is moderately high, whereas westward of 15 El' Agami island the coast recedes southward and is low and sandy.

The soundings decrease gradually towards the land, which should not be approached to a depth of less than 20 fathoms (36^m6), except to enter one of the passes.

A vessel waiting for a pilot off the entrance to Great pass should not 20 proceed inshore of a position 2 miles north-westward of Great pass beacon, situated $1\frac{1}{2}$ miles north-north-eastward of the tower on El' Agami island.

A black mooring buoy with the word " Pilot " in white letters, for the use of the pilot cutter, is moored in a position $5\frac{1}{2}$ cables north- 25 north-eastward of Great Pass beacon.

Target.—A small rectangular target is moored in the northern approach about 2 miles west-north-westward of Rās el-Tin lighthouse.

Current.—It is reported that strong winds from between west and north cause an easterly current which follows the shore from El' 30 Agami island to the Outer breakwater, where it sets northward across the entrance.

Chart 3119.

Lights.—Rās el-Tin light is exhibited, at an elevation of 180 feet (54^m9), from a black, iron framework, truncated, pyramidal structure, 35 22 feet (6^m7) in height, situated near the extremity of Eunostos point (*Lat.* $31^{\circ} 12' N.$, *Long.* $29^{\circ} 52' E.$).

Three lights, vertically disposed, are exhibited, at elevations of 58, 43, and 28 feet (17^m7, 13^m1, and 8^m5), from a circular tower, with red and white bands, 64 feet (19^m5) in height, known as Great Pass 40 low lighthouse, situated on the coast about $2\frac{1}{2}$ miles south-south-westward of Rās el-Tin light-structure.

Two lights, vertically disposed, are exhibited, at elevations of 124 feet and 94 feet (37^m8 and 28^m7), from a circular tower, with a black cupola surmounted by a ball and spike, known as Mex high 45 lighthouse, standing about 4 cables east-south-eastward of Great Pass low lighthouse.

A light for the use of aircraft is exhibited, when required, at an elevation of 106 feet (32^m3), from a position about $2\frac{1}{2}$ miles south- 50 south-westward of Mex high lighthouse.

A light is exhibited, at an elevation of 65 feet (19^m8), from a black and white chequered, octagonal, concrete tower, supporting an iron structure, named Great Pass beacon, situated on the southern side of the entrance to Great pass.

Charts 2630, 2606, 2158b, 449.

Chart 3119.

A light is exhibited, at an elevation of 60 feet (18^m3), from a black, square, tapered tower with white bands, standing on El' Agami island (Lat. 31° 09' N., Long. 29° 47' E.).

- 5 A light is exhibited, at an elevation of 47 feet (14^m3), from a white circular, stone tower, on a red masonry base, standing at the southern extremity of the Outer breakwater.

A light is exhibited, at an elevation of 51 feet (15^m5), from a white circular tower, on the head of Quarantine breakwater.

- 10 A light is exhibited, at an elevation of 12 feet (3^m7), from a black square, masonry tower, 10 feet (3^m0) in height, on the northern extremity of Timber Quays Detached breakwater.

- A light is exhibited, at an elevation of 47 feet (14^m3), from a black, hexagonal tower, on a red masonry base, standing on the northern
15 extremity of Coal quay.

A light is exhibited, on either side of the entrance to the Arsenal basin, and from the trucks of the two 330-foot (100^m6) radio masts, north-eastward of Rās el-Tīn lighthouse.

Charts 3119, 243.

- 20 **Entrance passes. — Depths. — Shoals. — Beacons. — Buoys. — Directions. — Prohibited anchorage. — Marabut pass.** — Marabut pass is only used by small vessels. It had, in 1944, a least depth of 20 feet (6^m1), situated about 10½ cables north-eastward of El' Agami Island lighthouse.

- 25 Foul ground, shoal patches, and above- and below-water rocks, extend about half a mile northward and eastward of Gezirat el Akrash and include the following :—Mudir rock, East rock, Mazula reef, Wells bank, and Malawany rock, situated about 1½ cables north-westward; 1½ cables south-south-westward, 2½ cables south-westward, 4½ and
30 4½ cables west-south-westward, respectively, from Etram reef.

- Browning bank, with a depth of 18 feet (5^m5) over it, lies about 2 cables north-westward of El' Agami island. The pass leads between Hommey shoal, with a depth of 17 feet (5^m2) over it, Etram reef, and a 13-foot (4^m0) shoal, situated about 7½ cables south-south-eastward of
35 Hommey shoal, on the south-western side, and El Medjul, with a depth of 12 feet (3^m7) over it, English shoal, with a depth of 19 feet (5^m8) over it, and an 18-foot (5^m5) patch, on the north-eastern side.

- A red conical buoy, No. 3, is moored on the south-western side of the pass about 10½ cables eastward of El' Agami Island lighthouse. Two
40 small grey conical buoys are moored north-eastward of the pass, one about 2 miles and the other about 2½ miles westward, respectively, of Mex high lighthouse.

- Dome beacon, 95 feet (29^m0) high, a stone beacon in the form of a dome, stands on the rocky ridge southward of El Dikheila, about one
45 mile south-eastward of El' Agami Island lighthouse.

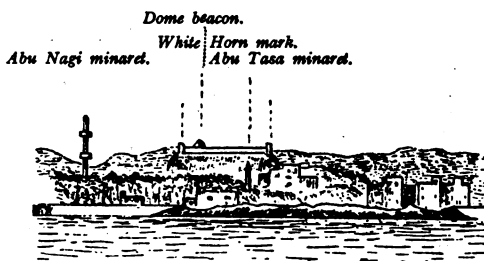
White Horn mark is a stone wall, 79 feet (24^m1) high, with a knob at each end, situated about one cable north-north-westward of Dome beacon (Lat. 31° 08' N., Long. 29° 49' E.).

- A vessel should approach and enter Marabut pass with Dome
50 beacon bearing 152°, one-quarter the distance from the east towards the west knob of the White Horn mark, or one third the distance from Abu Tasa to Abu Nagi minarets, and when the lighthouse on the southern end of the Outer breakwater bears 054° steer to pass about half a cable southward of it, and thence as directed below for Great pass.

Charts 2630, 2606, 2158b, 449.

Charts 243, 3119.

Great pass.—This pass is entered about $1\frac{1}{2}$ miles north-eastward of El' Agami island ; it is the principal pass through the reefs, and the only one available at night. It is one cable wide, in May 1949, a



Marabut pass.

least depth of 34 feet (10^m4) in the centre line, and has a sandstone 5 bottom.

Hydrographer shoal, with a least depth of 6 feet (1^m8) over it, lies on the south-western side of the pass, $3\frac{1}{2}$ cables east-south-eastward of Great Pass light-beacon.

Requin and Seuil shoals, each with depths of 20 feet (6^m1) over them, 10 lie about $1\frac{1}{2}$ cables and 3 cables southward, respectively, of Hydrographer shoal.

On the north-eastern side of the pass is a 20-foot (6^m1) patch, about 2 cables east-north-eastward of Great Pass light-beacon, and North shoal, with a depth of 18 feet (5^m5) over it, about 6 cables eastward of 15 the same beacon (*Lat. $31^\circ 10' N.$, Long. $29^\circ 48' E.$*). A mooring buoy, painted green, is laid close southward of North shoal.

In addition to Great pass low and Mex high lighthouses which, in line bearing 113° , mark the centre line of the pass, there are two pairs of beacons, situated close to the lighthouses, which, in line, mark either 20 side of the pass. The front beacon of the northern pair is a post, surmounted by a red cylinder, and the rear beacon is a mast, also surmounted by a red cylinder ; the front and rear beacons of the southern pair are similar in structure, respectively, but each is surmounted by 25 a black cone, point up.

The pass is buoyed in accordance with the Egyptian system (page 13), by a red conical buoy, moored about half a cable northward of the shoalest part of Hydrographer shoal ; by a red conical buoy, No. 2, moored near the entrance, about $3\frac{1}{2}$ cables north-westward of Great Pass light-beacon, and by a red can buoy, No. 4, moored about $1\frac{1}{2}$ cables 30 east-north-eastward of Great Pass light-beacon. In addition there is a light-buoy, No. 8, known as Pivot buoy, on the north-eastern side at the inner end of the pass, painted red, surmounted by a cylinder, and exhibiting a *red flashing* light.

A vessel should approach and enter Great pass with the leading 35 lighthouses or lights in line, bearing 113° , and maintain this transit as accurately as possible in the pass, the side limits of which are indicated, in daylight, by the beacons previously described. On arrival southward of the Pivot buoy a vessel should steer towards the entrance of the Outer harbour ; the Inner harbour should not be entered until 40 a berth has been assigned.

Charts 2630, 2606, 2158b, 449.

Charts 243, 3119.

Anchorage is prohibited within an area, indicated by pecked lines on the chart, extending about one mile west-north-westward of Boghaz disused low lighthouse. A pair of conical buoys, about half a cable apart, each of which is painted in blue and white chequers, are moored on the west-north-western limit of this area.

Boghaz pass.—Boghaz pass, the entrance to which lies about $2\frac{1}{2}$ miles north-eastward of El' Agami Island lighthouse (*Lat.* $31^{\circ} 09' N.$, *Long.* $29^{\circ} 47' E.$), is half a cable wide, with, in 1949, a least depth of 21 feet (6^m4); the maximum draught then allowed was 18 feet (5^m5). It is not available at night, and is impracticable for deep draught vessels when there is a heavy sea or swell. The depth is affected by the prevailing wind to the extent of 3 feet (0^m9); with smooth water in summer the depth is more than the normal, but in winter, when the sea is generally somewhat heavy, the depth is less.

Outer shoal, with a depth of 21 feet (6^m4) over it, and El Fara, with 7 feet (2^m1) over it, lie on the south-western side of the pass. An 18-foot (5^m5) patch, about 2 cables north-eastward of Outer shoal, and El Kot shoal, with a depth of 11 feet (3^m6) over it, lie on the north-eastern side; two detached 18-foot (5^m5) patches lie between the southern extremity of El Kot shoal and the north-eastern side of the pass.

Outer shoal and El Kot shoal are unmarked, but the 18-foot (5^m5) patch is marked by a pole beacon, 42 feet (12^m8) high, surmounted by a red cage, and a beacon, 32 feet (9^m7) marks the shoalest part of El Fara.

Black barrel buoys are moored about three-quarters of a cable and $3\frac{1}{2}$ cables east-south-eastward, and $3\frac{1}{2}$ cables south-eastward of El Kot shoal.

A black and yellow chequered buoy on the south-western side of the channel marks the north-eastern end of El Fara shoal.

A black barrel buoy is moored on the south-western side of the pass, about $4\frac{1}{2}$ cables south-south-eastward of El Kot shoal.

Boghaz low lighthouse (*Lat.* $31^{\circ} 09' N.$, *Long.* $29^{\circ} 51' E.$), but from which no light is exhibited, forms, with Mex high lighthouse, the leading line, bearing 134° for the centre of the pass; in addition there are two pairs of beacons, which, in line, mark each side of it. The front pair, situated on the coast, consist of posts, the north-eastern one surmounted by a red T, and the south-western one surmounted by a black diamond. The rear pair are the same beacons as those used as the rear pair for Great pass, described on page 101.

A vessel should enter Boghaz pass with the leading lighthouses in line, bearing 134° . These marks should be brought in line when well seaward of the pole beacon on the north-eastern side of the pass near its entrance, and the transit maintained as accurately as possible in the pass, the side limits of which are indicated by day by the beacons described above. When the lighthouse on the southern end of the Outer breakwater bears about 090° , a vessel should turn towards the entrance to the Outer harbour, and proceed as directed for Great pass.

A considerable cross current has been experienced in this pass, apparently caused by the prevailing wind.

For prohibited anchorages, see page 96 and above.

Corvette pass.—This pass has its entrance about one mile north-eastward of Boghaz pass. It is only used by small vessels with local

Charts 243, 3119.

knowledge. It has a least depth of 19 feet (5^m8), but a depth of 16 feet (4^m9) lies within a quarter of a cable of the track in a position about 1½ cables south-eastward of the beacon on El Hut rocks, described below.

The pass leads between El Ikhwan and El Hut rocks, the latter of which is marked, near its northern end, by a black beacon, 16 feet (4^m9) high (*Lat. 31° 11' N., Long. 29° 50' E.*); the rocks and shoals of El Kelb extend west-south-westward for about 6 cables from El Hut rocks.

The centre line of the pass is marked by two pole beacons, in line bearing about 182°. The front beacon, 88 feet (26^m8) high, is surmounted by two framework diamond shapes, vertically disposed, situated on the southern shore of Bâb el-'Arab bay, 4 cables south-south-westward of Great Pass low lighthouse; the rear beacon, 115 feet (35^m1) high, is surmounted by two framework balls, vertically disposed, situated 3 cables southward of the front beacon.

Hole in the Wall.—A narrow boat passage lies between Râs el-Tîn and the north-eastern end of the Outer breakwater. Its use is unpracticable in heavy weather, but at other times the dangers are readily apparent.

The leading marks for approaching this channel are the northern beacon on the Outer breakwater in line with the church spire, situated about 2½ cables south-westward of Fort Napoleon flagstaff, bearing 097°, until within a quarter of a cable of the breakwater. The channel then leads along the side of the breakwater and close to its end, thence turns southward; this passage was obstructed by boulders, in 1944.

Traffic regulations.—*Great and Boghaz passes.*—Only one steam vessel is permitted to use the same pass at a time.

Steam vessels leaving the port are to have priority over those entering.

Vessels not intending to enter the harbour should not approach the passes except in unavoidable circumstances.

Before entering a pass from seaward, steam vessels must, between sunrise and sunset, display the flags P.Z.H. of the International Code of Signals (wait) and sound their whistles. After sunset a *blue* light should be burnt and whistle sounded by all steam vessels approaching from seaward.

If an out-going steam vessel is in a pass at the time an in-coming one arrives at the seaward end, the out-going steam vessel will display the appropriate signal in the International Code of Signals signifying "wait" by day, or burn a *blue* light at night, and sound her whistle; the arriving steam vessel should then wait outside until the pass is clear.

By day.—Out-going steam vessels must not approach Great Pass pivot buoy (if using Great pass) or El Kot (if using Boghaz pass) within half a mile, in the event of a steam vessel entering the pass they require to use from seaward, until the arriving vessel is inside and clear of the pass. Vessels must not lie with the leading marks in line, so as to obscure them from a vessel entering.

Should both passes be signalled as in use, the out-going steam vessel must stop off Kamaria signal station (*Lat. 31° 10' N., Long. 29° 52' E.*) until the signal station indicates that all is clear.

When two vessels are proceeding out of the same pass, the second

Charts 2630, 2606, 2158b, 449.

Charts 243, 3119.

vessel must not bring the leading marks in line, so as to obscure them from the leading vessel, until the first is outside and clear.

If two steam vessels are likely to pass one another in the narrows between the breakwaters at the entrance of the harbour, the out-going vessel is to give way and stop until the in-coming one has entered.

At night.—Only Great pass is in use at night, and an out-going steam vessel must stop off Kamaria signal station when a signal shows that the pass is being used by an in-coming steam vessel until the signal station indicates that the pass is clear.

Sailing vessels crossing the paths of steam vessels in the passes do so at their own risk.

Sailing vessels must not anchor in the entrance between the Outer and Quarantine breakwaters.

15 Traffic Signals.—The following signals are made from Kamaria signal station, a white circular tower and a flagstaff on Kamaria hill, situated $3\frac{1}{2}$ cables north-eastward of the Quarantine port, Alexandria Outer harbour.

Chart 3119.

20	By Day.	By Night.	Signification.
	One ball at south-west yard-arm.	Two <i>white</i> lights, horizontal.	Great pass clear.
	One diamond at north-east yard-arm.	No signal made .	Boghaz pass clear.
25	Two balls, vertically disposed, at south-west yard-arm.	One <i>white</i> light at south-west yard-arm and one <i>red</i> light at north-east yard-arm.	Great pass closed for ships entering harbour as a ship is leaving.
30	Two diamonds, vertically disposed, at north-east yard-arm.	No signal made .	Boghaz pass closed for ships entering harbour as a ship is leaving.
35	Three balls, vertically disposed, at south-west yard-arm.	One <i>red</i> light at each yard-arm.	Great pass closed for ships leaving harbour as a ship is entering.
40	Three diamonds, vertically disposed, at north-east yard-arm.	No signal made .	Boghaz pass closed for ships leaving harbour as a ship is entering.
	Four balls, vertically disposed, at south-west yard-arm.	Two <i>red</i> lights, vertically disposed, at each yard-arm.	Port closed for ships entering or leaving.
45	Four diamonds, vertically disposed, at north-east yard-arm.	No signal made .	Boghaz pass closed for ships entering or leaving.

Note.—A vessel is in Great pass when she is between Great Pass beacon (*Lat. 31° 10' N., Long. 29° 48' E.*) and the pivot buoy.

50 A vessel is in Boghaz pass when she is between the black pole beacon and El Kot shoal.

Charts 2630, 2606, 2158b, 449.

Chart 3119.

Pilotage.—Pilotage is compulsory for all vessels except warships, State-owned ships, sailing vessels of less than 100 tons, and self-propelled craft of less than 150 tons burthen.

The only recognised pilots are those holding a permit from the Port and Light Administration; the Egyptian Government, however, accepts no responsibility for loss or damage, even if resulting from the action of a pilot holding such a permit.

In moderate weather, pilots are always outside the reefs, but in heavy weather, they remain inside the harbour entrance. The pilot tug is stationed at the entrance to meet all incoming vessels. A vessel requiring a pilot must hoist the pilot flag at the fore.

When the pilot boats cannot go out, a black flag, with two yellow crossed anchors, is displayed at the signal station and also at Rās el-Tīn lighthouse. If pilots are unable, on account of the sea, to board vessels the signal K.X.R. of the International Code of Signals is displayed from the pilot tug, and this signal is independent of any signals made from Fort Napoleon (Kôm el-Nadoura) signal station (*Lat. 31° 12' N., Long. 29° 53' E.*); commanding officers must then pilot their vessels through the pass, or remain outside until the weather moderates. The pilot's services commence, or end, abreast the Coal quay lighthouse.

When a man-of-war has obtained permission to enter the Inner harbour, a representative of the port authority will indicate the buoy to be picked up.

Vessels leaving which require a pilot should apply to the Port officer, and display the pilot flag at the fore.

Harbour pilots and mooring boats will be supplied on application to the Harbour master.

Dredging operations.—While dredging operations are in progress in a pass :—

The dredger displays a square red flag while working, and when this flag is dipped, it indicates that the pass is clear.

Out-going vessels, during dredging operations, must not proceed from the breakwater, where they should sound their whistles, to the entrance of the pass until the dredger has signalled that the pass is clear.

In-coming vessels must, on nearing the pass, sound their whistles, and remain outside the pass until the dredger has signalled that the pass is clear.

Vessels must pass the dredger at slow speed. A black ball at the yard-arm denotes the side on which the vessel is to pass.

The dredger, when at work at night, carries three electric lights, one at the bow, one at the stern, and one on the bridge, and, when not working at night, two *white* lights at the masthead. When the dredger is working at night leaving the pass free, she will carry a *white* light at the masthead, and two *white* lights above the bulwarks on the side a vessel is to pass.

ALEXANDRIA HARBOUR. — Outer harbour. — Breakwaters. — Submarine cables.— The Outer breakwater extends 6 cables south-westward from Ras el-Tīn (*Lat. 31° 12' N., Long. 29° 52' E.*), thence 13 cables southward; Quarantine breakwater extends 2½ cables north-westward from Quarantine quay, situated about

Charts 2630, 2606, 2158b, 449.

Chart 3119.

6½ cables northward of Mex high lighthouse, leaving an entrance between the two breakwater ends of 430 yards (393^m2).

The Outer breakwater is separated at its north-eastern end from an islet, 12 feet (3^m7) high, near Eunostos point by the *Hole in the Wall* already described. The top of the breakwater is about 10 feet (3^m0) above the lowest level of the sea. There is a pole beacon, surmounted by a diamond, near the north-eastern end of the breakwater; five pylons stand on this breakwater, the northernmost is 102 feet (31^m1) high, situated about 8½ cables south-south-westward of the pole beacon.

The Quarantine port lies at the south-eastern end of Quarantine breakwater, between Quarantine quay and the shore north-eastward.

Timber Quays breakwater is situated with its southern end about 2 cables eastward of the head of Quarantine breakwater, and extends about 4 cables north-eastward.

Rās el-Tīn jetty extends about three-quarters of a cable southward from Eunostos point, and, from a point about a quarter of a cable eastward of its southern end, a curved and detached breakwater, about 2 cables long, known as the Inner breakwater, extends south-eastward. A Police hut stands on the eastern extremity of the Inner breakwater (*Lat. 31° 11' N., Long. 29° 52' E.*).

Numerous submarine cables, all of which are indicated on the chart, are laid in the Outer harbour and include the following:—From the southern end of the Outer breakwater to the head of Quarantine breakwater, and also southward, across the harbour entrance, to the shore in the vicinity of Great Pass low lighthouse; from the southern head of Timber quays breakwater to the shore south-eastward; and southward from the eastern end of the Inner breakwater.

Depths.—Buoyage.—In the south-eastern part of the Outer harbour there are depths of over 36 feet (11^m0). In its northern part there are depths of from 19 to 37 feet (5^m8 to 11^m3), with three isolated 18-foot patches lying about 2 cables south-eastward of the north-eastern part of the Outer breakwater, and within a distance of 5½ cables south-south-westward of Rās el-Tīn lighthouse. The western and north-western parts of the Outer harbour are obstructed by a bank, with depths of from 6 to 18 feet (1^m8 to 5^m5) over it, extending, in places, to a distance of about 4 cables eastward of the Outer breakwater; the southern part of this shoal water is known as Harbour bank.

In the Coal basin, situated in the north-eastern corner of the Outer harbour, there is a least depth of 30 feet (9^m1) to within a distance of about 200 feet (61^m0) of Coal quay (page 107).

A conical light-buoy, painted red, exhibiting a *red flashing light* every three seconds, is moored about one mile southward of Rās el-Tīn lighthouse.

A red conical buoy is moored close off the north-eastern end of Timber quays breakwater.

There are numerous mooring buoys in the Outer harbour, some of which are indicated on the chart.

A mooring buoy for the use of the Examination vessel is moored about 4½ cables north-north-eastward of the lighthouse on the southern end of the Outer breakwater (*Lat. 31° 10' N., Long. 29° 51' E.*).

Prohibited area.—A prohibited area, indicated by pecked lines on

Chart 3119.

the chart, lies in the western part of the Outer harbour, in the vicinity of Harbour bank.

Quays.—Berths.—There are numerous berths in the Outer harbour, which are indicated on the chart by a letter and a numeral 5 within a circle.

In the Coal basin there are seven numbered alongside berths as follows: On the south-western side, Nos. 55 and 56, with a total length of 860 feet (262^m1), and depths of 19 and 20 feet (5^m8 and 6^m1) alongside, respectively; in the curve, Nos. 57, 58, and 59, with 10 respective lengths of 430, 440, and 425 feet (131^m1, 134^m1, and 129^m5), and depths alongside of from 26 to 28 feet (7^m9 to 8^m5); on the north-eastern side, Nos. 60 and 61, with a total length of 725 feet (221^m0), and depths alongside of 17 and 21 feet (5^m2 and 6^m4), respectively.

Petroleum quay, southward of the Coal basin, has depths of from 15 3 to 11 feet (0^m9 to 3^m4) alongside. There are three piers for the discharge of petroleum of which Mantacheff jetty is the largest. South-westward of Petroleum quay is the Vacuum Oil Company's jetty, beyond which is Gabari dry dock, the entrance to which is protected, on its western side, by a breakwater (*Lat. 31° 10' N., Long. 29° 52' E.*). 20

The Timber quays consist of three moles, alongside which there are eleven berths, namely, Nos. 71 to 81, with depths of from 20 to 26 feet (6^m1 to 7^m9) alongside.

Kamaria port lies close south-westward of the Timber quays and contains three berths, Nos. 82 to 84, with depths of less than 12 feet 25 (3^m7) at a distance of 30 feet (6^m1) seaward of the berths.

Nitrate quay, situated about 2 cables south-westward of Kamaria port, is used for landing nitrates.

Petroleum harbour, which was under construction in 1949, is between Quarantine breakwater and Nitrate quay, and its limits are indicated 30 by pecked lines on the chart.

Quarantine port has three berths, Nos. 85, 86, and 87; in 1948, there was a depth of 20 feet (6^m1) alongside No. 86 berth. An area, dredged to a depth of 22 feet (6^m7), in 1943, is indicated by pecked 35 lines on the chart.

For further information regarding depths at the numbered berths, see Table of berths (1948) on chart 3119.

The Coal quay and the quays on the south-eastern side of the Outer harbour are connected to the Egyptian railway system.

Inner harbour. — Depths. — Basins. — Submarine cables. — 40 There are depths of from 19 to 41 feet (5^m8 to 12^m5) in the Inner harbour, but a shoal, with depths of from 6 to 18 feet (1^m8 to 5^m5), extends about 3½ cables from the northern shore. An isolated patch, with a depth of 18 feet (5^m5) over it, lies about one cable south-westward of the entrance to Arsenal basin. 45

At the north-eastern end of the Inner harbour are the Arsenal and Careening basins, the entrance to which is 107 yards (97^m8) wide, with a depth in it of 24 feet (7^m3). In the fairway of the Arsenal basin there are depths of from 19 to 30 feet (5^m8 to 9^m1), but a shoal, with a depth of less than 18 feet (5^m5) over it, extends about 1½ cables from the 50 northern side. In the Careening basin, which is only available for small craft, there is a least depth, in the middle, of 15 feet (4^m6).

On the northern quay of the Arsenal basin (*Lat. 31° 12' N., Long. 29° 53' E.*) are situated the workshops of the Coastguard Adminis-

Charts 2630, 2606, 2158b, 449.

Chart 3119.

tration, the establishments of the Ports and Lighthouses Administration, and three small slipways. Opposite the central office of the Port Administration is the Government landing place of Alexandria harbour, which is reserved exclusively for the use of Government craft. A jetty, about half a cable long, with depths alongside of from 8 to 14 feet (2^m4 to 4^m3), at right angles to the quay, is reserved for the Port Administration; on the western side of this jetty is the Marine Air port, with a small jetty at its north-western end.

- 10 The speed of launches in Arsenal and Careening basins must not exceed 4 knots, in order to prevent damage to vessels lying therein. Numerous submarine cables are laid in the inner harbour, the positions of which are indicated on the chart. See pages 13-14.

Quays. — Berths. — Aircraft moorings.—The quays of the Khedivial Mail Steamship Company are on the north-eastern side of the Arsenal basin. At the north-western end of the Careening basin is No. 8 berth, about 300 feet (91^m4) long; on the eastern side is the Quai de l'Ancienne Douane, 1,180 feet (359^m7) long, which is the usual landing place. Nos. 6 and 7 berths are situated on the south-eastern and south-western sides, respectively, of the Careening basin; at No. 6 berth are the disinfecting station, quarantine and passport offices.

The Quai de l'Arsenal (Arsenal quay), situated on the south-eastern side of the Arsenal basin, has a projection north-eastward and another north-westward, each with three berths, Nos. 8 to 10 and Nos. 11 to 13, respectively; the former have depths of from 10 to 18 feet (3^m0 to 6^m1), and the latter depths of from 19 to 22 feet (5^m8 to 6^m7), alongside them.

Nouveau quai extends about one cable south-westward from Quai de l'Arsenal (*Lat.* 31° 12' N., *Long.* 29° 53' E.), and has one berth, No. 14, on its north-western side, with a depth of 21 feet (6^m4) alongside. On its south-eastern side are two berths, Nos. 20 and 21 which, in 1943, were dredged to a depth of 27 feet (8^m2), as indicated by pecked lines on the chart; there is a berth, No. 22, north-eastward of No. 21, with the vessel's stern to the quay, in which there are depths of from 7 to 14 feet (2^m1 to 4^m3). There is also a berth on the south-western side, No. 15, with a depth alongside of 17 feet (5^m2). Extensions to Nouveau quai were under construction, in 1949, within the area indicated by pecked lines on the chart.

40 Quai Centrale (Central quay), on the eastern side of the Inner harbour, is divided into two parts at the junction of Rue Bâb el Karaste, which gives free access to and from the town. There are three berths in each part, Nos. 23 to 25 in the northern part and Nos. 26 to 28 in the southern part.

45 In 1943, an area off No. 24 berth had been dredged to a depth of 28 feet (8^m5), as indicated by pecked lines on the chart. In 1944, depths at Nos. 23 to 27 berths varied from 21 to 29 feet (6^m4 to 8^m4), outside the pontoons, and there was a depth of 18 feet (5^m5) alongside No. 28 berth. The Custom house is situated opposite No. 25 berth.

50 Quai Moss (Moss quay) is situated close southward of No. 28 berth and vessels secure stern on to this part of the quay. There are two berths, Nos. 29 and 30 on its north-eastern side and, in 1944, there was a depth of 26 feet (7^m9), outside the pontoon, at No. 29 berth. On its

Charts 2630, 2606, 2158b, 449.

Chart 3119.

south-western side is No. 31 berth, which, in 1944, had a depth of 20 feet (6^{m1}) alongside.

A bank, with depths of less than 18 feet (5^{m5}) over it, extends a short distance off the north-western end of Quai Moss. 5

The area lying eastward of a line joining the south-eastern extremity of Nouveau quay (*Lat. 31° 12' N., Long. 29° 53' E.*) and the north-western extremity of Quay Moss had, in 1944, depths of from 23 to 34 feet (7^{m0} to 10^{m4}).

The quay between Quay Moss and the entrance to the Mahmudiya canal, about 1½ cables southward, is only available for small craft; two wooden jetties, each about 100 feet (30^{m5}) long, extend at right angles to this quay. 10

Quai du Mahmudiya (El Mahmudiya quay), on the western side of the canal mouth, extends northward and thence north-westward. The eastern side of this quay, where there is one berth, No. 33, is reserved for Nile boats using the canal. 15

There are four berths, Nos. 34 to 37, alongside the north-eastern side of Quay du Mahmudiya, with depths, in 1944, of from 15 to 23 feet (4^{m6} to 7^{m0}). On the western side of the inner part are two berths, Nos. 42 and 43, with a depth of 25 feet (7^{m6}) outside the pontoons. On the south-western side of the outer part are three berths, Nos. 39 to 41; in 1944, there was a depth of 25 feet (7^{m6}) at Nos. 39 and 40 berths, and No. 41 berth had been destroyed and was foul. On the north-western side there is one berth, No. 38, with a depth alongside, in 1944, of 24 feet (7^{m3}). There is one berth, No. 44, between the roots of Quai du Mahmudiya and Coal quay, which, in 1943, was dredged to a depth of 20 feet (6^{m1}) alongside, as indicated by pecked lines on the chart. 20 25

Coal quay (*Lat. 31° 11' N., Long. 29° 52' E.*) extends about half a mile north-westward from the south-western end of No. 44 berth and thence curves south-westward and south-south-eastward, forming the Coal basin. 30

From near the inner end of Coal quay, Old Coal quay extends about 1½ cables northward and, in between, is one berth, No. 45, with a depth alongside, in 1944, of 23 feet (7^{m3}) outside the pontoon; there are two berths, Nos. 46 and 47, on the eastern side of Old Coal quay, with depths, in 1944, of from 24 to 26 feet (7^{m3} to 7^{m9}), outside the pontoons. On the western side of Old Coal quay, where there are two berths, Nos. 48 and 49, an area, indicated by pecked lines on the chart, had been dredged, in 1943, to a depth of 25 feet (7^{m6}); in 1944 there were depths of from 24 to 25 feet (7^{m3} to 7^{m6}) outside the pontoons at these two berths. 35 40

On the north-eastern side of Coal quay, north-westward of Old Coal quay, there are five berths, Nos. 50 to 54, and, in 1944, there was a depth of 26 feet (7^{m9}) at these berths, outside the pontoons. The berths in the Coal basin are described on page 105. 45

For further information regarding depths at the numbered berths, see Table of berths (1948) on chart 3119.

Mahrousa jetty lies on the western side of the Inner harbour, about 2 cables eastward of Rās el-Tin lighthouse (*Lat. 31° 12' N., Long. 29° 52' E.*), and has a length of about 660 feet (201^{m2}). 50

Lighthouse pier is situated about 2 cables westward of the head of Mahrousa jetty.

Charts 2630, 2606, 2158b, 449.

Chart 3119.

Aircraft moorings are laid in the area northward of a line joining the south-western corner of Mahrousa jetty and Lighthouse pier, as indicated by a pecked line on the chart.

- 5 **Prohibited area.**—Navigation is prohibited within an area, indicated by pecked lines on the chart, between Mahrousa jetty and Arsenal mole; a white can buoy, surmounted by a cylinder, marks the western end of this area, and is moored close south-eastward of the head of Mahrousa jetty.
- 10 **Mahmudiya canal.**—El Mahmudiya canal connects the Inner harbour with Atfih, on the Rosetta branch of the Nile, and about 15 miles above the town of Rosetta. It has two locks, and is about 48 miles long and tortuous, with a least width of 27 yards (24^m7); the greatest depth is 8½ feet (2^m7), and it is less during the period preceding
- 15 the rise of the Nile. The draught of the Nile boats which use this canal is not more than 5 feet (1^m5) when the river is in flood, and 4 feet (1^m2) during the winter closure; navigation is slow and difficult.

Water level.—Strong westerly winds raise the water 1½ feet (0^m5) above the level of ordinary high water, and nearly 3 feet (0^m9) above the

20 low level caused by strong easterly winds.

From the records of the self-registering gauge at Mahmudiya canal, it appears that there are two regular tides every 24 hours, with a range of about 9 inches (0^m2) at springs and 4 to 5 inches (0^m1) at neaps. There is a slight diurnal inequality more marked at neaps than at

25 springs. The alteration in the mean level, probably caused by wind, amounts to about 9 inches (0^m2). The mean level of the sea in August, September, and October is 7 inches (0^m2) higher than in February, March, and April.

There is an automatic tide gauge near the inner end of the Quarantine breakwater.

30

Harbour regulations.—No vessel is to proceed at a greater speed than 10 knots when in the Outer harbour, nor greater than 5 knots, when rounding the Coal quay (*Lat. 31° 11' N., Long. 29° 52' E.*) and in the Inner harbour.

- 35 All in-coming vessels are to display the quarantine flag and their number before rounding the Outer breakwater, and are to keep the former flying until pratique is obtained, and the latter until they arrive in the Inner harbour, or for a reasonable time after anchoring in the Outer harbour.

- 40 All vessels arriving from an uninfected port, and having no sickness on board, may proceed into the Inner harbour, where they will be boarded by the Quarantine officer, but they are not to go alongside the quays until pratique has been obtained.

- All vessels arriving from an infected port are to anchor in the quarantine anchorage in the Outer harbour, north-north-eastward of the
- 45 Timber quays, where they will be visited by the Quarantine officials.

- Should the Quarantine office receive information that a port has become contaminated with plague or cholera, the pilots will be advised. The production of bills of health is obligatory at all times by vessels
- 50 arriving in an Egyptian port, and only those delivered within 48 hours previous to departure from the port of origin will be considered valid.

Declaration of arrival must be made at the Port office in the Arsenal basin (*Lat. 31° 12' N., Long. 29° 53' E.*), within 24 hours of arrival. The boarding office will be open every day from 0800 to 1430, except

Chart 3119.

on Sundays, single day holidays, and the first day of longer holidays. During the remaining days of the longer holidays the boarding service will be maintained.

A vessel arriving with fire on board will not be permitted to enter the Inner harbour, but will be taken to such anchorage as the Harbour master may direct.

When a vessel has powder or other explosives on board, a red flag by day and a *red* light at night are to be displayed before entering the Outer harbour. Vessels with explosives or petroleum on board are to anchor in the Outer harbour, and are not allowed in the Inner harbour.

Any vessel ordered by the Port police to have no communication with the shore, will display flags T.P. of the International Code of Signals by day, and a *red* light by night.

Shipping companies and owners, conjointly with the captains of the vessels, will be held responsible for the observance of the above regulations, and for any collision or damage which may result from the infringement of them.

Application for a berth alongside a quay, or for permission to secure to a buoy, must be made to the Superintendent of the Quay at the Quay office on P.L. form No. 180 (supplied gratis to shipping agents and captains on request). Applications for berths in the Arsenal (*Lat.* 31° 12' N., *Long.* 29° 53' E.) and Careening basins, and on the eastern side of Inner harbour northward of Mahmudiya canal must be approved by the Customs Administration before being sent to the Quay office. If a particular berth is required, the vessel first entering the harbour will have the prior claim, and should that vessel be placed in quarantine, the next in order of entering will take precedence of others. No vessel will be forced to take any particular berth if it is not desired by the agent or captain.

Police.—The Port police office is situated at the usual landing stage in the Careening basin. The Port police launches fly a green pendant with the word "Police" in white letters.

Vessels requiring assistance from the Port police should display flags S.T. of the International Code of Signals.

A vessel requiring the fire brigade or fire float, should use the following signals :—

By day.—The flags D.Q. of the International Code of Signals.

At night.—A gun, or explosive signal, fired at intervals of one minute, or continuous sounding with any fog signal apparatus.

Alexandria. — History. — General remarks. — Alexandria is the most important city in the eastern part of the Mediterranean. The ancient city was founded in 332 B.C. by Alexander the Great, from whom it takes its name ; it stood a little southward of the present town, and its magnificence was so remarkable that the Romans ranked it next to their own capital. Pompey's (Diocletian's) pillar is still standing and several ruins of this epoch remain. In 1517, when it was taken by the Turks, its former splendour vanished and the city was reduced to ruins. In 1778, the population was about 6,000. Under Mohammed Ali (1805–49) the city recovered, and a large part of the commerce of Egypt now passes through it.

Alexandria was very strongly fortified before its bombardment by the British fleet in 1882. In addition to several forts inside the city walls, a chain of forts, redoubts, and round towers crowns the heights

Chart 3119.

around, and extends westward for several miles along the shore as far as Tabia-el-Mex fort. From this latter, situated close south-westward of Great Pass low lighthouse (*Lat.* $31^{\circ} 09' N.$, *Long.* $29^{\circ} 51' E.$), a great fortification stretches across the narrow isthmus between Lake Maryut and the sea, the level of which, in August, is 13 feet (4^m0) higher than that of the lake, when the latter dries one or two miles from the banks.

The modern town of Alexandria, which, in 1947, had a population of 925,081, is situated on and within a peninsula projecting about a mile north-north-westward from the coast, the outer end of which divides into narrow arms stretching south-westward and north-eastward. On the south-western arm are Räs el-Tîn palace, the barracks, radio station, a military hospital, and, near the extremity, Räs el-Tîn light-house. On the extremity of the north-eastern arm is the square Fort Qaitbai, built on the site of the famous ancient *Pharos*. The town is built on low-lying ground and the shore of the bay to Fort Abbassia is flat. A narrow ridge of rocky hills commences between Mex and El Dikheila and runs in a south-westerly direction, parallel to and between the coast and the shore of Lake Maryut. The ridge has been much quarried near El Dikheila and presents an irregular outline.

Signal station.—The signal station at Fort Napoleon, also known as Kôm el Nadoura), is a group of dwellings on the top of a hill, about 3 cables eastward of the middle of the eastern shore of the Inner harbour, and 198 feet (60^m3) high, with a flagstaff; vessels are signalled when sighted. Communication can be made by the International Code of Signals.

Time signal.—A time signal is made from Fort Napoleon (*Lat.* $31^{\circ} 12' N.$, *Long.* $29^{\circ} 53' E.$); see Admiralty List of Lights.

Climatic tables.—See page 33.

Storm signals.—Storm signals are displayed from Fort Napoleon at about 1500 daily, and indicate that a gale may be approaching as shown below; their exhibition cannot be guaranteed on Fridays and on Government holidays.

Signal	Signification.
Cone, point up . . .	Gale commencing from between west and north.
Cone, point down . . .	Gale commencing from between south and west.
Two cones, one above the other, points up.	Gale commencing from between north and east.
Two cones, one above the other, points down.	Gale commencing from between east and south.
Two cones, bases together	Very heavy gale.

Port facilities.—Large repairs to vessels' hull and machinery can be carried out.

There is a dry dock, details of which are given in Appendix I, and eight slipways, the largest of which takes vessels up to 400 tons.

The wharf crane of the Khedivial S.S. Co. has a lifting capacity of 20 tons. The Ports and Lights Administration have several cranes,

Charts 2630, 2606, 2158b, 449.

Chart 3119.

the largest of which has a lifting capacity of 30 tons. There are seven floating cranes, with capacities, respectively, of 90, 60, 36, two of 20, 15, and 8 tons, and three floating sheers, with capacities, respectively, of 30, 25 and 8 tons. On the Quay du Mahmudiya (*Lat. 31° 11' N., Long. 28° 53' E.*) there are eight travelling cranes with capacities of 2½ to 5 tons.

Large quantities of coal and oil fuel are kept in stock. A certain amount of diesel oil is available.

Several tugs are available.

Water is laid on to the quays and there are also water-boats for supplying vessels in the harbour.

There is a hospital, and a Sailors' home, with good accommodation, near the entrance to the Mahmudiya canal.

Communications.—There is regular steamer communication with European ports in the Mediterranean, also with ports in Palestine and Syria.

Alexandria is connected to the Egyptian railway, telegraph, and telephone systems.

There is a regular Air service with England, South Africa, and India.

Trade.—The principal exports are corn, cotton, wool, gum, soda, rice, dates, beans, sugar, senna, feathers, hides, cotton seed, and cigarettes. The chief imports are cotton and woollen goods, coal, timber, tobacco, cigars, hardware and haberdashery.

Radio stations.—There is a radio station north-eastward of Rās el-Tīn lighthouse (*Lat. 31° 12' N., Long. 29° 52' E.*). See page 15.

A radio D.F. station is situated about three-quarters of a cable north-north-eastward of Rās el-Tīn lighthouse.

Consul.—A British Consular Officer resides at Alexandria.

Deratisation.—See page 15.

Chart 243.

COAST.—Between Rās el-Tīn and Fort Qaitbai, about 1½ miles north-eastward, is El-Anfūshi bay, with Fort El Atta at the north-eastern end of the bay. Reefs lie from 2 to 4 cables off the coast, and the bay is encumbered with foul ground and only used by fishing craft.

Eastern harbour.—Eastern harbour is contained between Fort Qaitbai, on which stands a beacon, and the site of Fort El 'Silsila, one mile eastward; the latter stood at the end of a low rocky point 3 cables in length, since artificially built up.

A breakwater extends 2½ cables eastward from Fort Qaitbai, and 2 cables from its outer end is El 'Silsila detached breakwater, which extends 4 cables eastward to within one cable of the site of Fort El 'Silsila. The harbour is entered between these breakwaters. There are several mooring buoys close southward of Fort Qaitbai.

A sea wall extends along the southern shore of the harbour and there are two mooring buoys close southward of Fort Qaitbai.

For landmarks, see pages 96, 97.

Although used in ancient times, when the famous Pharos stood in the position of Fort Qaitbai, and Cleopatra's Needle stood near the southern shore, the harbour is now little frequented. It is much encumbered by shoals and rocky patches amongst which are:—El 'Ganem rock, with a depth of less than 6 feet (1m8) over it, situated

Charts 2630, 2606, 2158b, 449.

Chart 243.

about $1\frac{1}{4}$ cables south-south-eastward of the beacon on Fort Qaitbai ; a 6-foot (1^m8) patch, lying about $1\frac{1}{4}$ cables south-westward of El 'Ganem rock, and marked by a red can buoy moored close north-
5 eastward of it ; El 'Fullill, a rock, awash, situated 5 cables south-south-eastward of El 'Ganem rock, and El Jemel, a rock, with a depth of less than 6 feet (1^m8) over it, lying 5 cables eastward of El 'Fullill rock.

Vessels occasionally shelter in the harbour, but strong northerly
10 winds cause a heavy swell and the holding ground of rock, sand, and weed is poor.

Dangers in approach to Eastern harbour.—Bittern shoal, with a depth of 29 feet (8^m8) over it, lies 9 cables northward of Fort Qaitbai.

Diamond rock (*Lat. 31° 13' N., Long. 29° 53' E.*), awash, lies about
15 one cable north-eastward of Fort Qaitbai. Yarf el Wasat, with a depth of 16 feet (4^m9) over it, lies about half a cable northward of the head of the breakwater extending from Fort Qaitbai.

El 'Hassan, with a depth of 2 feet (0^m6) over it, and steep-to on its seaward side, lies about 3 cables northward of the site of Fort El
20 'Silsila.

El 'Nassar, an extensive rocky bank with several very shallow heads, over which the sea usually breaks, lies about one cable northward of the eastern extremity of El 'Silsila detached breakwater, and depths of less than 3 fathoms (5^m5) extend 2 cables northward from the
25 eastern half of the same breakwater.

Lights.—A light is exhibited, at an elevation of 42 feet (12^m8), from a black tripod surmounting a low, octagonal, masonry tower on the outer end of the breakwater extending from Fort Qaitbai.

A light is exhibited, at an elevation of 50 feet (15^m2), from a red,
30 square, iron tower on the western end of El 'Silsila detached breakwater.

Prohibited anchorage.—Anchorage is prohibited, owing to the existence of submarine cables, within an area, indicated by heavy pecked lines on the chart, immediately north-eastward of Eastern harbour.

Anchorage.—Anchorage may be obtained, in depths of from 5 to 6 fathoms (9^m1 to 11^m0), about 2 cables southward of Fort Qaitbai breakwater light-structure. Small vessels anchor under the lee of Fort Qaitbai (*Lat. 31° 13' N., Long. 29° 53' E.*), securing their sterns to the breakwater.

40 *Chart 2681.*

Coast.—Beacon.—The coast from the site of Fort El 'Silsila to Fort El-Burg, which stands on the western entrance point of Abu Qîr bay, 11 miles north-eastward, is sandy with numerous cliffs. It is fringed with rocks and shoal water which extend $1\frac{1}{4}$ miles offshore, in places.
45 A sea wall runs from Râs el-Tîn to Muntazah, about 4 miles south-westward of Fort El-Burg.

The extensive suburbs of Alexandria, consisting of El Ibrâhimiya and Ramleh, extend along the coast north-eastward of Eastern harbour. Near their north-eastern end, and about 7 miles north-eastward
50 of Râs el-Tîn lighthouse, stands Ramleh palace, a prominent building on a high sea wall, with a pointed cupola, 137 feet (41^m8) high.

Between Ramleh palace and Fort El-Burg, the following objects are conspicuous and easily identified :—The minaret of Sidi Bishr, 144 feet (43^m9) high, about three-quarters of a mile north-eastward of Ramleh

Charts 2606, 2158b, 449.

Chart 2681.

palace; El-Muntazah palace, a large red building with a tower, 120 feet (36^m6) high; a water tower, 4 cables north-westward of El-Muntazah palace, and a water tank on columns on Fort Raml, 125 feet (38^m1) high, about 11 cables southward of Fort El-Burg. 5
Another prominent tower stands 4 cables south-westward of El-Muntazah palace.

An iron framework beacon, painted in black and white chequers, 18 feet (5^m5) in height, is situated on the summit of an islet, 7 feet (2^m1) high, situated about 3 cables west-north-westward of Sidi Bishr 10 minaret (*Lat.* 31° 16' N., *Long.* 29° 59' E.).

Muntazah harbour, with depths in it of from 9 to 16 feet (2^m7 to 4^m9), lies close north-westward of Muntazah palace. It is a small artificial harbour, formed by a breakwater extending southward from Geziret Halâwa, an island lying off its entrance, and a narrow sandbank 15 joining the south-eastern side of Geziret Halâwa to the mainland. A bridge also connects Geziret Halâwa with the mainland.

Navigation prohibited.—Navigation is prohibited within a radius of 3 miles of El-Muntazah palace.

Off-lying dangers.—Ibn Asil, a rocky patch, with a depth of less 20 than 6 feet (1^m8) over it, which breaks heavily, lies about a mile northward of Geziret Halâwa. A shoal, with a depth of 15 feet (4^m6) over it, and another, with a depth of 21 feet (6^m4) over it, about one cable southward of it, lie about 1½ miles westward of Fort El-Burg. 25

El Ukhtein, a patch, formed by ruins, over which the sea constantly breaks, lies about 1½ miles west-north-westward of Fort El-Burg.

Sultan shoal, with a least depth of 27 feet (8^m2) over it, lies about 2½ miles northward of Fort El-Burg; about 6 cables eastward of Sultan shoal is a patch, with a least depth of 28 feet (8^m5) over it, 30 and about 9 cables south-westward is a depth of 34 feet (10^m4).

The depths between Muntazah harbour and Nelson island, about 2½ miles north-eastward of Fort El-Burg (*Lat.* 31° 20' N., *Long.* 30° 04' E.), are very irregular, and it is recommended that the coast should not be approached in depths of less than 10 fathoms (18^m3). 35

Sea Green shoal, with a least depth of 50 feet (15^m2) over it, lies about 12½ miles northward of Fort El-Burg.

Chart 2681, Abu Qîr bay.

Abu Qîr bay.—Abu Qîr bay is contained between Fort El-Burg and the western entrance point of the Rosetta mouth of the Nile, about 40 17 miles north-eastward; its shores are very low and sandy.

Abu Qîr village, situated about half a mile south-westward of Fort El-Burg, is a summer resort, and is connected to the Egyptian railway system.

The following objects in the bay are conspicuous and easily identi- 45 fied:—Fort El-Burg; the old Quarantine house, situated about 3 cables south-westward of Fort El-Burg; a minaret in Abu Qîr village, standing about 3 cables southward of the old Quarantine house; the 125-foot (38^m1) water tank on Fort Raml, already mentioned, and the two towers and building on Fort El-Hamra, situated 50 about 5 miles south-eastward of Fort Raml.

A sea wall extends along the coast between Fort Raml and Fort El-Hamra, and behind this wall are forts Nos. 1 to 4. No. 1 Fort, which is in ruins, is situated 1½ miles south-south-eastward of Fort

Chart 2681, Abu Qîr bay.

Raml, and Nos. 2, 3, and 4, which are disused, stand about half a mile southward, $1\frac{1}{2}$ and 2 miles south-eastward, respectively, from No. 1 Fort.

5 *Chart 2681.*

On the coast between Fort El-Hamra and the village of Idku, about 8 miles east-north-eastward, are four disused forts :—Fort El Maaddiya, 33 feet (10^m1) high ; Fort Labbani, 15 feet (4^m6) high ; Fort El-Kalakh (El Kilh), 28 feet (8^m5) high, and Fort El-Gazâyir, 24 feet
10 (7^m3) high, situated one mile eastward, $2\frac{1}{2}$ miles, $3\frac{1}{2}$ miles, and $4\frac{1}{2}$ miles east-north-eastward, respectively, from Fort El-Hamra (*Lat.* $31^\circ 16' N.$, *Long.* $30^\circ 09' E.$).

Idku village lies about one mile inland and is situated on a sandhill 80 feet (24^m4) high, on the northern bank of Lake Idku ; a minaret,
15 the top of which is 121 feet (36^m9) high, stands in the village.

On the shore abreast Idku is a disused fort, known as Fort El-Sheik (Abd er Razig), 40 feet (12^m2) high, with some black huts on it, and between this fort and Rosetta light-structure, about $11\frac{1}{2}$ miles north-north-eastward, are four other disused forts :—Fort El-Nawa, 27 feet
20 (8^m2) high, Fort El 'Alayim, 27 feet (8^m2) high, Fort El-Farsh (Farish) 18 feet (5^m5) high, and Fort El 'Abd, 37 feet (11^m3) high, situated close to the coast about 2 miles apart. All these forts have the appearance of sand mounds, with the exception of Fort El 'Abd which has some black huts on it.

25 Coastguard stations are established at several of the disused forts in Abu Qîr bay as indicated on the chart.

From Idku, sandhills, from 50 to 100 feet (15^m2 to 30^m5) high, extend in a north-easterly direction as far as the river Nile.

Chart 2681, Abu Qîr bay.

30 **Islands and dangers.**—**Light.**—Nelson island, 30 feet (9^m1) high, is fringed for the greater part by foul ground. There are many reefs, shoals, and patches of foul ground on which the sea breaks, between the island and Fort El-Burg. Although there are navigable channels between these dangers they are impracticable for any vessel with a
35 draught of more than 10 feet (3^m0), and all are dangerous as the rocks are unmarked.

A light is exhibited, at an elevation of 40 feet (12^m2), from a red, square, iron tower, on a white base, 10 feet (3^m0) in height, situated on the summit of Nelson island (*Lat.* $31^\circ 21' N.$, *Long.* $30^\circ 06' E.$).

40 *Chart 2681.*

Culloden reef, with a least depth of 14 feet (4^m2) over it, lies about $1\frac{1}{2}$ miles north-eastward of Nelson island, with rocks and shoals between them ; about $2\frac{1}{2}$ cables north-eastward of the reef there is a shoal with a depth of 18 feet (5^m5) over it. Patches of foul ground, on which the
45 sea breaks, lie about $2\frac{1}{2}$ and 5 cables, respectively, north-eastward of the north-eastern extremity of Nelson island, and depths of less than 3 fathoms (5^m5) lie within a mile eastward and south-eastward of the island.

A patch of foul ground, on which the sea breaks, lies half a mile
50 north-eastward of Fort El-Burg, and between this patch and the fort there are several rocks above and below water. Another patch of foul ground, on which the sea breaks in bad weather, lies $1\frac{1}{2}$ miles east-north-eastward of Fort El-Burg.

The whole of Abu Qîr bay westward of a line joining the 18-foot

Charts 2630, 2606, 2158b, 449.

Chart 2681.

(5^m5) shoal north-eastward of Culloden reef and Fort Labbani, 6½ miles south-south-eastward, is encumbered with shoals with depths of 3 fathoms (5^m5), or less, over them. North-eastward of this line, however, there are depths of over 5 fathoms (9^m1) between it and Rosetta mouth to within 1½ miles of the shore, with the exception of Dibt Kawaly shoal, with a least depth of 21 feet (6^m4) over it, lying 7 miles east-north-eastward of Nelson Island light-structure, and two patches, with a least depth of 27 feet (8^m2) over them, situated about 2½ miles eastward and 3½ miles south-eastward, respectively, of Nelson Island light-structure (*Lat.* 31° 21' N., *Long.* 30° 06' E.).

Chart 2681, Abu Qir bay.

Anchorage.—Directions.—Anchorage may be obtained by large vessels, in a depth of about 8 fathoms (14^m6), sand, with the southern extremity of Nelson island bearing 270°, distant 1½ miles.

Small vessels may obtain anchorage, in depths of from 21 to 30 feet (6^m4 to 9^m1), with the eastern extremity of the island bearing about 353°, distant 6½ cables.

There are several anchorages in the south-western part of Abu Qir bay, in depths of about 18 feet (5^m5), sheltered from westerly winds, but local knowledge is necessary to reach them.

A vessel approaching from the westward should keep well northward of Sultan shoal and Culloden reef and round the latter at a distance of not less than 6 cables, with Fort El-Hamra bearing about 177°. When Nelson island bears 270° she should steer for the anchorage.

A small vessel should steer for Fort El-Burg, bearing 248°, until the eastern extremity of Nelson island is nearly abeam, when she should steer for the anchorage south-south-eastward of the island, recommended above.

Chart 2630.

River Nile.—The river Nile, a few miles below Cairo, divides into two main streams, which enter the Mediterranean by the Rosetta and Damietta mouths; the area enclosed between the two branches is the present delta of the Nile.

The annual rising of the Nile with its inundations generally commences at Cairo about the end of June, but sometimes two or three weeks later; it continues about two months, and then gradually subsides, and at this time the river rises from about 14 to 29 feet (4^m3 to 8^m8); it carries a great quantity of sand and mud, which discolours the sea for many miles, and occasionally the discoloration assumes the appearance of a shoal. The alluvial matter is taken away by the general easterly current, and forms the banks and shoals along the coast eastward.

Access to the river by the Rosetta or Damietta mouths is prevented from April to August by the mud weirs, known as “sadd,” which are built across the river at this time of the year.

Access to the Nile above the delta barrages from the two branches is only possible during the short periods when these are navigable, and then only by vessels, the dimensions of which permit them to pass the barrage locks, the least dimensions being 165 feet (50^m3) by 36·3 feet (11^m1), for both branches.

After the sadd is cut in August, it is possible to enter the Rosetta mouth and navigate the river to the delta barrage, 147 miles up, but only while the flood remains high; this may be for two or three months.

Charts 2606, 2158b, 449.

Chart 2630.

When the flood subsides navigation is only possible as far as Quddaba, 60 miles up.

The Damietta branch is navigable from about August 15th until 5 February 1st. At Zifta, 97 miles up, there is a lock 206 feet (62^m8) by 37 feet (11^m3). For vessels able to pass the lock, navigation is possible as far as the delta barrage for two or three months during the flood (August—November).

Chart 2681.

10 The entrance to Rosetta mouth (*Lat. 31° 30' N., Long. 30° 20' E.*) is from about 2½ to 5 cables in width; a conspicuous light-structure stands on its western entrance point. It is nearly barred by extensive sandbanks, which extend about 1½ miles outside the entrance, and depths of less than 6 fathoms (11^m0) extend 3½ miles northward of the 15 light-structure. The banks, however, vary their formation and position in accordance with the state of the river and the prevailing weather conditions. At times they extend right round the mouth of the river into Abu Qir bay.

A very narrow channel, with a depth of 7 feet (2^m1) in it, lies between 20 the banks, but its position is subject to constant alteration. Native craft are piloted into the river by a native pilot, who sounds out the channel about 3 hours before their arrival.

Inside the bar, the depths increase rapidly to 12 and 20 feet (3^m7 and 6^m1), and this depth is maintained for many miles.

25 In the summer a large sardine-fishing fleet is usually to be found near the mouth of the river and westward of the light-structure.

On each side of the river, about one mile above the mouth, is a disused fort, that on the eastern bank being known as Fort El-Bûghâz el Sharqîya (El-Bûghâz fort east), and that on the western bank as 30 Fort El-Bûghâz el Gharbiya (El-Bûghâz fort west); the Coastguard barracks, which have a bright red roof and are prominent, stand on the western bank of the river, about half a mile above Fort El-Bûghâz el Gharbiya.

About 3½ miles above the mouth, thick palm groves, the north- 35 western limit of which is clearly defined, line the banks and, from this point, villages extend along the banks, almost as far as the town of Rosetta, which lies about 7 miles south-eastward of the light-structure (*Lat. 31° 30' N., Long. 30° 20' E.*).

Burg Migheizel minaret, 64 feet (19^m5) high, stands on the eastern 40 bank of the river, about 2½ miles south-eastward of Fort El-Bûghâz el Sharqîya, and abreast of it, on the opposite bank, is Fort Quai bai, now disused.

The town of Rosetta, in which there are two minarets, 130 and 118 feet (39^m6 and 36^m0) high, respectively, is connected to the 45 Egyptian railway system and to the general telephone system. In 1947, it had a population of 28,698.

Light.—A light is exhibited, at an elevation of 171 feet (52^m1), from a black, iron, tripodal tower, surmounted by a lantern, painted with black and white bands, situated on the western side of the entrance 50 to Rosetta mouth. See view facing page 39.

Deratisation.—See page 15.

Chart 2630.

Coast.—The coast between Râs Umm el-Nabâyil, the north-eastern entrance point of Rosetta mouth, and Cape Burullus (Brulos),

Charts 2606, 2158b, 449.

Chart 2630.

34 miles eastward is low and sandy. Kôm Mastura (Masturu), 74 feet (22^m6) high, about 17 miles eastward of Ras Umm el-Nabâyil, and Kom el Magsaba, 51 feet (15^m5) high, about 3 miles farther eastward, are good landmarks when near the coast. 5

The small outlet of the extensive Lake Burullus is at Cape Burullus. It is navigable by light-draught fishing craft during the time the river Nile is in flood; at other times of the year the entrance is almost entirely silted up.

Light.—El-Burullus (Brulos) light (*Lat. 31° 35' N., Long. 31° 05' E.*) 10 is exhibited, at an elevation of 180 feet (54^m9), from a black, iron, tripodal tower, with a lantern painted in black and white chequers, about 5 miles eastward of Cape Burullus. See view facing page 39.

Off-lying shoals.—**Caution.**—A shoal, with a least depth of 25 feet (7^m6) over it, lies about 3½ miles north-north-westward of 15 Cape Burullus, and depths of 5 and 6 fathoms (9^m1 and 11^m0) lie 2½ miles offshore between Cape Burullus and the lighthouse.

A 3-fathom shoal, hard sand, on which breakers have been observed during a moderate northerly wind, lies 1½ miles north-north-westward of the lighthouse. A vessel should not attempt to pass between this 20 shoal and the coast, as a spit, with depths of from 1½ to 2½ fathoms (2^m7 to 4^m6) over it, extends 2 miles west-north-westward from the coast at the lighthouse, and about one mile offshore.

Coast.—The coast between El-Burullus lighthouse and the Damietta mouth of the Nile, about 40 miles eastward, consists of low sand- 25 hills.

Near the coast, about 10 miles eastward of El-Burullus lighthouse, is El Aiyash, Fort No. 6, and 9 miles farther eastward is El Qar'a, Fort No. 5. Both are in ruins and have the appearance of sand mounds; they are used as coastguard stations, the buildings being situated 30 either inside or near the forts.

At the mouth of Bahr Basandila, about 16 miles west-south-westward of Damietta lighthouse, is Ashtum Gamasa, Fort No. 4, a ruin which has the appearance of a flat-topped brown mound; it is 28 feet 35 (8^m5) high, and inside its walls are coastguard buildings.

Between Ashtum Gamasa fort and El Sheikh Yusef fort, half a mile south-westward of Damietta lighthouse, are Forts 3, 2, and 1, respectively, from the westward, about 2½ miles apart. All are in ruins and have the appearance of sand mounds. At Fort No. 3, situated 7 miles eastward of Ashtum Gamasa fort there is a coastguard station, the 40 buildings of which show over the top of the mound.

Between the Rosetta and Damietta mouths, close off the coast the bottom is mostly sand, of a dark colour, heavy, and quite different from that found westward of Abu Qir bay, which is light in colour and formed of coral and shells. 45

Off-lying dangers.—Damietta banks are three narrow shoals of sand and mud lying from about 7 to 12½ miles westward of Râs el-Barr (*Lat. 31° 32' N., Long. 31° 51' E.*), the western entrance point of the Damietta mouth. The outer bank has a least depth of 22 feet (6^m7) near its eastern end; the middle bank has a least depth of 10 feet 50 (3^m0) at its eastern extremity situated 7 miles westward of Râs el-Barr, with a 12-foot (3^m7) patch three-quarters of a mile farther westward; the southern bank, which lies from 3 to 4 miles offshore, has a least depth of 15 feet (4^m6) at its eastern end. There are depths of from 6½ to

Chart 2630.

8 fathoms (11^m5 to 14^m6) between this bank and the middle bank, and from 7 to 9½ fathoms (12^m8 to 17^m4) between the latter and the outer bank.

5 **Current.**—The current is uncertain, but generally sets eastward at from half a knot to one knot. It is greatly influenced both in rate and direction by strong winds. An indraught sets into the bays. From the coast to about half a cable off it a strong current sets westward, and in consequence great care should be taken when landing.

10 **Directions.**—It is not advisable to approach El-Burullus lighthouse nearer than 8 miles, nor into depths of less than 12 fathoms (21^m9), particularly eastward of the lighthouse; vessels should steer to pass about 5 miles northward of the 3½-fathom (6^m9) patch of the outer Damietta bank, and in the neighbourhood of these banks they should
15 not get into depths of less than 14 fathoms (25^m6).

Chart 3567, plan of Damietta mouth.

Damietta mouth.—The Damietta mouth is the entrance to the eastern branch of the Nile. The western bank is a low sand spit terminating in Rās el-Barr, and extends about one mile north-eastward
20 from El-Sheikh Yūsef fort, a ruin which has the appearance of a flat-topped sand mound. The mouth between the northern end of this spit and the low eastern entrance point about 2 miles northward of Damietta lighthouse (*Lat.* 31° 31' N., *Long.* 32° 51' E.) is nearly filled by a sandbank partly awash. A very narrow channel with a shifting
25 bar with a greatest depth of 8 feet (2^m4) over it, lies about half a mile from the northern end of the spit; there is another channel with a shifting bar and with a greatest depth of 4 feet (1^m2) over it, between the north-eastern end of the sandbank and the eastern entrance point. After heavy gales these channels are liable to alter both in position and
30 depth, so the passage should not be attempted even in boats without the aid of the local pilot. A heavy surf usually breaks on the sandbank, and communication is frequently stopped for several days together. The river deepens considerably inside the bar, there being about 3½ fathoms (6^m4) abreast El-Sheikh Yūsef fort, and there appears
35 to be a least depth of 2½ fathoms (4^m6) to Damietta town.

Damietta light-structure stands, on the eastern side of the entrance, 6½ cables southward of Rās el-Barr. By day the lighthouse is dwarfed by four radio masts, two of which are about 350 feet (106^m7) high, and two about 260 feet (79^m2) high, all of which are situated close
40 eastward of it. These radio masts and the lighthouse are visible before the land is sighted.

The ruined fort of El Sharqiya, which has the appearance of a flat-topped sand mound, is situated on the east bank of the river, 2 cables south-south-westward of Damietta light-structure; a water tower,
45 about 75 feet (22^m9) high, stands close southward of the fort.

Fort Ezbet el-Burg, with prominent yellow walls, and considerably larger than Fort El Sharqiya, is situated about 6 cables southward of the 75-foot (22^m9) water tower, just mentioned, and is now the headquarters of the Damietta district coastguard. Close southward of this
50 fort are two minarets.

Another fort, with a minaret close south-south-eastward of it, lies about half a mile south-south-westward of Fort Ezbet el-Burg. There are several palm groves along the east bank of the river between Fort Ezbet el-Burg and Damietta town, which are visible from seaward.

Chart 3567, plan of Damietta mouth.

On the west bank of the river, about half a mile north-westward of Fort Ezbet el-Burg, there is a minaret, about 85 feet (25^m9) high.

Chart 2573.

A tower, about 220 feet (67^m1) high, stands on the east bank of the river, about 3½ miles south-south-westward of Damietta light-structure.

Damietta.—Damietta town is situated on the east bank of the river, 7½ miles from Damietta mouth, and is surrounded by trees. In 1947, the population was 53,620.

There are several high minarets and chimneys in the town, the tops of which can be seen above the trees, and two water towers, the northern one about 100 feet (30^m5) high, and the southern one about 160 feet (48^m8) high; all these objects are visible from seaward.

Chart 3567, plan of Damietta mouth.

Lights.—Damietta light (*Lat. 31° 31' N., Long. 31° 51' E.*) is exhibited, at an elevation of 171 feet (52^m1), from a black, iron, tripodal tower, with a lantern painted in black and white stripes, on the eastern side of the entrance to Damietta mouth, about 6½ cables southward of Rās el-Barr. See view facing page 39.

A light is exhibited, at an elevation of 18 feet (5^m5), from a pyramidal structure with black and white bands, on El-Metras rock, about half a mile northward of the Damietta light-structure.

A light is exhibited, at an elevation of 12 feet (3^m7), from a pyramidal structure, with black and white bands, on a concrete base, 14 feet (4^m3) in height, at El Girbi (Ghirby), nearly 1½ miles south-south-westward of Damietta light-structure.

Chart 2573.

Caution.—Caution is necessary in approaching Damietta light-house, as depths of 6 fathoms (11^m0), or less, extend about 3½ miles northward and 5½ miles north-eastward of it, and there is an occasional indraught; constant sounding is therefore necessary. Damietta light has been mistaken for that of Port Said; attention is therefore drawn to the characters of the respective lights.

Chart 3567, plan of Damietta mouth.

Anchorage.—Small craft which cannot cross the bar often anchor north-westward of the river bar in a depth of about 4 fathoms (7^m3). During westerly winds they sometimes shelter under Kawa Burun (*Lat. 31° 33' N., Long. 31° 52' E.*), the eastern entrance point. The period of high river, from about August to November, is known locally as the Ziyadet el-Nil; trading vessels then anchor very close to the bar in a depth of slightly more than their own draught.

Pilot.—There is a pilot attached to the port who boards vessels outside the bar if weather permits, otherwise he waits in the channel, and indicates the passage.

Deratisation.—See page 15.

Chart 2573.

Coast.—Between Kawa Burun and Port Said, about 29 miles south-eastward, is the Bight of Dība, the shore of which is a strip of very low sand, about 2 cables in width, in places, which separates Lake Manzala from the sea.

About 15½ miles south-south-eastward of Kawa Burun are the ruins of Fort El-Dība, which stand at the ancient Mendesian mouth of the Nile, now closed; another old fort, used as a coastguard station,

Charts 2630, 2606, 2158b, 449.

Chart 2573.

which has the appearance of a flat-topped sand mound, lies about half a mile south-south-westward of it.

About $7\frac{1}{2}$ miles south-eastward of Fort El-Dība is the El-Gamīl entrance to Lake Manzala ; the channel is about half a cable wide, with a depth of 3 feet (0^m9) on the bar. There are greater depths inside for a short distance, when it again becomes shallow. On the low sandy coast on the western side of the entrance, stands Fort El-Gamīl (*Lat.* $31^{\circ} 17' N.$, *Long.* $32^{\circ} 11' E.$) in ruins, and near it is a coastguard station, having the appearance of a sand mound.

Between Fort El-Gamīl and Port Said three prominent rectangular beacons stand on the coast, distant about $4\frac{3}{4}$, $3\frac{1}{4}$ and $1\frac{1}{2}$ miles, respectively from Port Said lighthouse. In 1948, the westernmost beacon was reported to have partially collapsed and to be leaning over at an angle of about 20 degrees from the vertical. The centre beacon is surmounted by a square and the easternmost beacon by an inverted triangle.

The coast westward of the inner end of the West breakwater at Port Said has advanced seaward about 3 cables since 1860, and there is now a broad road running along it in front of the English hospital, outside which is a sandy beach about a quarter of a cable wide, and advancing.

Caution.—The soundings outside the 10-fathom (18^m3) edge of the coastal bank cannot be depended upon, depths of from 6 to 8 fathoms (11^m0 to 14^m6) having been reported off Damietta and Port Said. See also caution on page 119.

Tidal streams.—A tidal inflow and outflow has been observed at El-Gamīl ; the in-going stream sets along the coast from the westward and enters Lake Manzala obliquely ; the out-going stream issues at a great rate after high water, and carries with it quantities of mud.

Currents.—The current off this coast generally sets south-eastward, at from half a knot to a knot ; it is greatly influenced both in rate and direction by strong winds. When the earth bank, which is constructed across the Nile at Damietta in February or March, is cut in August to allow the flood water to pass, the rate of the current may be slightly augmented within 10 miles of the coast ; the flow from the river becomes greatest in September or October, after which it decreases, becoming small in December. The limit of the outflow of the river is clearly marked by the muddy appearance of the water ; this limit varies considerably, but, in 1919, was not observed at a greater distance than 12 miles offshore.

Within a cable of the coast between the eastern entrance point of the Rosetta mouth and Fort El-Dība (*Lat.* $31^{\circ} 22' N.$, *Long.* $32^{\circ} 04' E.$), a strong eddy often sets ; care must be taken in this vicinity when landing.

PORT SAID. — Approach. — Beacons. — The coast near Port Said is unusually low, only the lighthouse, town, and shipping being seen in the offing, and the prominent rectangular beacons described above.

Chart 234.

On approaching Port Said the following objects are conspicuous and easily identified :—The lighthouse, 193 feet (58^m8) high, situated near the inner end of the western breakwater ; a chimney, 175 feet (53^m3) high, in the Suez Canal Company's works on the south-eastern side of

Chart 234.

the harbour, standing about 5 cables south-south-eastward of the lighthouse; and the green-tiled domes of the Suez Canal Company's offices, the central and highest of which is 120 feet (36^m6) high, situated about 4½ cables south-south-westward of the lighthouse.

There are four prominent rectangular beacons on the coast south-eastward of the entrance to the Suez canal, the westernmost of which, known as beacon C, is painted black and surmounted by a square; it is 32 feet (9^m8) high, and stands about 1½ miles south-eastward of Port Said lighthouse (*Lat.* 31° 16' N., *Long.* 32° 19' E.). Beacon C bis, surmounted by an inverted triangle, stands about one mile south-eastward of beacon C; beacon D, painted black, 35 feet (10^m7) high, and surmounted by a square, stands about 11 cables south-eastward of beacon C bis. The south-easternmost beacon (chart 2573), surmounted by a square, stands 2½ miles south-eastward of beacon D.

Current.—Caution.—In the approach to Port Said the current is very uncertain, depending on the wind; it usually sets south-south-eastward at a rate of from half a knot to 1½ knots; on striking the West breakwater it turns northward. Owing to the uncertainty of the current, and the low coast, caution is necessary when approaching the port.

Outer anchorage.—The most convenient anchorage off Port Said is eastward of and outside the outer channel buoys, clear of shipping entering or leaving the Canal.

At present this area is obstructed by wrecks, so until these are removed vessels should anchor well westward or northward of these buoys. The bottom is of mud, and the holding ground is good.

Harbour.—The harbour is formed by two concrete breakwaters extending from the sandy coast. The West breakwater extends 2½ miles north-eastward from the De Lesseps monument at the western entrance point of the harbour. The inshore portion of this breakwater is built of concrete blocks, with a level surface on top and on its eastern side; the western side has a fringe of irregularly placed blocks. The outer portion of the breakwater consists of irregularly placed concrete blocks. The breakwater is being continued for about 1½ miles in a north-easterly direction.

The East breakwater (*Lat.* 31° 16' N., *Long.* 32° 20' E.), the inner end of which lies about 9 cables south-south-eastward of the inner end of the West breakwater, extends about 1½ miles north-north-eastward. A jetty extends about 2½ cables north-westward from East breakwater from a point about half a mile from its northern end.

The Central mole extends about 4½ cables north-westward from the East breakwater from a point about 3 cables from its inner end, and forms the north-eastern side of the Canal Company's basin. From the north-western end of the Central mole a narrow arm extends about a cable north-north-eastward, parallel to East breakwater.

Channel.—Depths.—The entrance channel to Port Said is straight and its axis is in a 217° direction; its length from the outer light-buoys to abreast the main lighthouse is about 4½ miles, and its breadth decreases from about 3 cables at the outer end to about 180 yards (164^m6) at the inner end.

The depths in the entrance channel abreast of and outside the end of the West breakwater are liable to change, but dredging operations maintain a minimum depth of 35 feet (10^m7), which permits vessels

Charts 2573, 2630, 2606, 2159b, 449.

Chart 234.

with a draught of 34 feet (10^m4) to use it. Dredging is, however, not carried out in, or around, the harbour, except in the channel and basins; the depths are continually altering, consequently those shown on the plan may not be correct.

Basins.—The Outer basin, westward of the East breakwater, provides berths for vessels, and there are also berths on either side of the channel, between the Outer basin and Ismail basin, which, with those in the Outer basin, have the deepest draught, in the port.

- 10 Ismail basin, or the inner harbour, had, in 1949, depths of from 39 to 43 feet (11^m9 to 13^m1); on its north-western side are Commercial, Arsenal and Cherif basins, with, in 1949, a least depth of 42 feet (12^m8) in the fairway. Commercial and Arsenal are mostly used by craft belonging to the Suez Canal Company; the wharves in the latter
- 15 are connected to the Egyptian State railway system.

South-westward of the Central mole, and extending as far as the root of the East breakwater is a basin containing the floating dock, and having slips and the Canal Company's workshops on its south-western shore; it is used by the Canal Company for mooring and repairing

20 their floating plant, and had, in 1949, depths of from 7 to 21 feet (2^m1 to 6^m4).

- Several islands extend in a line south-westward of the outer end of the Central mole, and are known as follows, in order from north-east to south-west, :—Chantier island, Island No. 1, Island No. 1 bis,
- 25 Island No. 2, Island No. 3, Island No. 4, and Island No. 5; the two latter are situated south-eastward of Island No. 3. These islands are mostly occupied by coal stores and engineering works, and between them and the south-eastern shore is the Coaling basin. Southward of Island No. 4 is Hussein coaling basin (*Lat. 31° 14' N., Long. 32° 18' E.*).
- 30 Abbas Hilma (Hilmi) or Africa basin is situated on the western side of the port, south-westward of Ismail basin; it is chiefly used by vessels remaining some time in the port, and had, in 1949, depths of from about 20 to 40 feet (6^m1 to 12^m2).

- There are two basins for vessels loading or unloading petroleum.
- 35 One is off the west bank southward of Abbas Hilma basin, which consists of four oiling berths which are connected to the bank by floating pipe-lines. The other, known as Petroleum basin, consists of berths off the east bank close southward of Hussein coaling basin, and a basin farther southward, the entrance to which is protected by a
- 40 swinging gate.

Lights.—Port Said light is exhibited, at an elevation of 184 feet (56^m1), from an octagonal stone tower with black and white stripes, and a time ball on the balcony, 193 feet (58^m8) in height, situated near the inner end of the West breakwater.

- 45 Leading lights are situated on the western side of the port; the front light, known as Lake lighthouse, is exhibited, at an elevation of 97 feet (29^m6), from a grey iron framework tower, 74 feet (22^m6) in height, situated at the northern end of Abbas Hilma basin; the rear light is exhibited, at an elevation of 142 feet (43^m3), from a grey iron
- 50 framework tower, situated about 7 cables south-westward of the front light-structure. These lights in line bear 217°.

A light (*Lat. 31° 16' N., Long. 32° 19' E.*) is exhibited from the head of the jetty extending north-westward from the East breakwater.

A light is exhibited, at an elevation of 26 feet (7^m9), from a grey,

Chart 234.

circular, iron structure, 19 feet (5^m8) in height, situated on the northern extremity of the arm extending north-north-eastward from Central mole.

Lights are also exhibited, from the western side of No. 3 island, from the western entrance point of the Petroleum basin, and from the southern end of Abbas Hilma basin.

Lights are occasionally exhibited from the look-out of the Suez Canal Company's offices.

Buoyage.—A line of 12 pillar buoys, about one cable apart, each surmounted by a white spherical topmark, is moored on the eastern side of the prolongation of the West breakwater; the north-eastern-most buoy is moored off the extremity of the prolongation, about 4 miles north-eastward of Port Said lighthouse.

A pair of light-buoys indicate the entrance to the channel. The western buoy, No. 6, painted black, surmounted by a cone, and exhibiting a *white flashing* light, is moored about 5 miles north-east of Port Said lighthouse. The eastern buoy, painted red, surmounted by a cylinder, and exhibiting a *red quick flashing* light is moored about 3½ cables south-eastward from No. 6 buoy.

Five pairs of light-buoys indicate the limits of the channel within the outer pair. The western buoys, numbered 1 to 5 from the inner end of the channel, are painted black and exhibit a *green fixed* light; the eastern buoys are painted red and exhibit a *red fixed* light.

A light-buoy, painted black, and exhibiting a *green fixed* light, is moored off the southern entrance point of Cherif basin (*Lat. 31° 16' N., Long. 32° 18' E.*).

A pair of pillar light-buoys, moored close westward of the Petroleum basin, indicate the entrance to the Suez Canal. The western buoy is painted white and exhibits a *red fixed* light; the eastern buoy is painted in black and white horizontal stripes and exhibits a *green fixed* light.

The channel within the inner pair of light-buoys is marked by black can buoys on the western side, and by red can buoys on the eastern side.

The black and white conical buoys are moored close off the entrance points, respectively, of the Outer basin.

A can buoy, painted in black and white horizontal stripes, is moored close south-eastward of the southern entrance point of Abbas Hilma basin.

There are several sets of mooring buoys, and vessels are allotted berths by the officials of the Suez Canal Company. The berths at the mooring buoys are numbered and lettered from seaward, and are termed red or black, according to which side of the channel they are on. The positions of the mooring buoys are indicated on the chart.

Sea level.—The mean sea level at Port Said varies with the seasons; in February, the sea is at its lowest level, and in July it is at its highest. The mean difference, however, does not exceed 9 inches (0^m2). Strong northerly winds occasionally raise the level one foot (0^m3), and, rarely 2 feet (0^m6), above the previously existing level. During a period of six years, the difference between the highest and lowest levels observed amounted to 4½ feet (1^m4).

Pilots and pilot signals.—All vessels of over 500 tons gross must, on entering or leaving Port Said, take a pilot of the Canal Company,

Chart 234.

who will furnish all particulars as to the course to be steered. The Company have the right to send either a pilot or a master to vessels of less than 500 tons.

- 5 Pilotage begins and ends at the outer pair of light-buoys marking the entrance to the channel, about 5 miles north-eastward of Port Said lighthouse (*Lat. 31° 16' N., Long. 32° 19' E.*).

The pilot vessels are steam vessels and their funnels are painted black with a white band ; the word " Pilote " is painted on each bow ;
10 the vessels display flag G of the International Code of Signals, and at night one white above one red light, vertically disposed, at the mast-head.

A vessel requiring a pilot to enter Port Said by day should display flag G of the International Code of Signals, or her national pilot flag,
15 and at night hoist lights at the foremast head and fire rockets or burn blue lights.

The above signals will be answered thus :—

If the state of the sea permits the pilot vessel to go out :—

<p>By day.—Flag G of the International 20 Code of Signals, at the pilot vessel's masthead.</p> <p>At night.—A <i>white</i> rocket or Morse signal.</p>	}	The pilot is going out to you.
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Should the sea prevent the pilot boarding the vessel, the pilot vessel
25 will make the following signals when near her :—

<p>By day.—Flags J.T. of the Inter- national Code of Signals.</p> <p>30 By night.—A <i>blue</i> light or Morse signal.</p>	}	Follow the pilot vessel, the pilot will come on board under the lee of the break-water.
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Should the sea prevent the pilot vessel going out :—

<p>By day.—Flags K.X.R. of the Inter- 35 national Code of Signals, hoisted at Port Said light-house.</p> <p>At night.—A <i>red</i> rocket and, if neces- sary, Morse signal.</p>	}	The pilot vessel cannot go out.
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40 Vessels in the harbour requiring a pilot by day display flag G of the International Code of Signals, or the national pilot flag ; and at night hoist three *white* lights, vertically disposed, at the foremast head.

Vessels proceeding through the Canal should hoist the signal 1½ hours before the pilot is required.

45 Pilots for vessels sailing for sea or for changing berth are due on board only 30 minutes after the signal has been hoisted.

Directions.—The leading lighthouses (*Lat. 31° 16' N., Long. 32° 19' E.*) in line, seen midway between the lines of red and black light-buoys marking the sides of the channel, bearing 217°, lead to the
50 entrance ; thence keep midway between the lines of these buoys, and the buoys marking the channel inside them.

Charts 2573, 2630, 2606, 2158b, 449.

Chart 234.

Vessels entering or leaving must, especially in bad weather, keep a good distance from the red buoys, showing a *red* light, which mark the edge of the bank on the east side of the channel, so as to avoid being set on to this bank by the very strong cross current then running 5 at the entrance to the channel.

Should the sea prevent the pilot coming on board a vessel, he will, when near her, make the signal (*see* page 124) to follow the pilot vessel ; it is then necessary to follow her closely to enter the harbour. But as the pilot may be unaware of the draught of the vessel, it is for the 10 Captain's consideration as to whether he can follow with safety, or if he should keep at sea, or anchor.

No vessel should attempt to enter when the pilot vessel is prevented by the weather from going out.

A vessel entering in heavy weather, without a pilot, should steer 15 about 217° from well outside the outer light-buoys to midway between them proceeding at a speed of about 10 knots, and then pass close to the north-western buoys ; when under the lee of the West breakwater, the speed can be reduced and a pilot taken on board.

No vessel of deep draught should attempt to enter Port Said during 20 a westerly gale, especially at night.

If there are any dredgers at work in the channel, they must be passed on the side indicated by their signals ; *see* page 126.

Signal station.—Signals.—There is a signal station at Port Said lighthouse, and at the Canal Company's office (*Lat.* 31° 15' N., *Long.* 25 32° 18' E.).

Captains of vessels fitted with radio are earnestly requested to transmit to their agents, as soon as the vessel comes within range, the following information :—

The name and nationality of the vessel. 30

Whether they intend passing through the canal or merely stopping in the harbour.

The probable hour of arrival and the duration of stay.

Whether they carry any dangerous stores or cargo.

The following signals must be displayed on entering Port Said :— 35

When nearing the buoys at the approach to the channel, a vessel wishing to enter must hoist the signal for a pilot as indicated on page 124.

The captain must clearly show when entering the channel :—

(a) The vessel's commercial number in the International code. 40

(b) The vessel's distinctive signal (mail vessel, oil vessel, vessel having explosives, etc.) as given in the Special Signal book.

(c) If necessary, the quarantine flag.

By mail steamers.—A blue flag with the letter P in white in the middle by day, and a *white* light at night. This signal is not com- 45 pulsory, but is usually shown when in the Canal.

By tank steam vessels carrying petroleum, oil, or other petroleum products in bulk :—When the petroleum has a flash point below 73° F., a red flag between two balls by day, and three *red* lights, vertically disposed, by night. 50

When the petroleum has a flash point between 73° and 150° F., a red flag over a ball by day, and two *red* lights over one *white* light by night.

By steam vessels with explosives on board.—A ball over a red flag by day, and one *white* light over two *red* lights by night.

Chart 234.

By vessels under compulsory or voluntary quarantine.—A yellow flag by day, and a *red* light over a green light by night.

By vessels with coal cargoes for Port Said.—Flag J of the International Code of Signals, by day.

Dredger signals.—The following signals are displayed by dredgers :

A cylinder at the yard-arm, by day, and a *white* light at the mast-head, with two *white* lights, horizontally disposed, on one side of the bulwark, by night, indicate that the passage is clear on the side marked.

10 A cylinder at both yard-arms, by day, and a *white* light at the mast-head, with two *white* lights, horizontally disposed, on both sides of the bulwark, by night, indicate that the passage is clear on both sides.

Two cylinders, vertically disposed, at the yard-arm, by day, and a *red* light at the masthead, by night, indicate that the passage is not clear.

Storm signals.—The following storm signals are displayed at Port Said lighthouse (*Lat. 31° 16' N., Long. 32° 19' E.*) by day only, at about 1500, but their exhibition is not guaranteed on Fridays and Government holidays :—

20	Signal.	Signification.
	Cone, point up	Gale commencing from between west and north.
	Cone, point down	Gale commencing from between south and west.
25	Two cones, vertically disposed, points up	Gale commencing from between north and east.
	Two cones, vertically disposed, points down	Gale commencing from between east and south.
	Two cones, bases together	Very heavy gale.

30 **Harbour signals.**—The following signals of the International Code of Signals are to be shown by vessels to indicate their movements in Port Said harbour :—

	Signal.	Signification.
35	No. 2 pendant at the dip, or two <i>white</i> lights, vertically disposed close up to the masthead.	Vessel is making fast.
	Flag G at the dip, or a <i>red</i> light over a <i>white</i> light close up to the mast-head.	Vessel is getting under way to proceed to sea.
40	No. 1 pendant at the dip, or a <i>white</i> light over a <i>red</i> light close up to the masthead.	Vessel is getting under way to enter the Canal.

When the above movements are completed, the signals are to be hauled down or the lights extinguished.

Charts 2606, 2158b, 449.

Chart 234.

Signal.	Signification.
No. 2 pendant over the Answering pendant, or a <i>red</i> light between two <i>white</i> lights, vertically disposed; both the pendants and the lights of this signal are shown close up to the masthead.	Vessel has stopped her movement and may be passed or overtaken. 5
Five or six blasts on the steam whistle, repeated several times at short intervals, and in addition at night a <i>red</i> light shown aft.	I have reduced speed and may be obliged to stop or make fast. 10

Regulations.—The following are extracts from the regulations issued by the Suez Canal Company for vessels approaching, and whilst in, Port Said harbour. For full regulations, *see* Red Sea and Gulf of Aden Pilot. 15

The port officials direct the vessel to its mooring berth either by signals hoisted at the masthead of the Company's office (*Lat. 31° 15' N., Long. 32° 18' E.*), or verbally by sending a boat to meet the vessel. The vessel must acknowledge by hoisting the answering pendant. 20

At night, the vessel, either moored or manœuvring, must show the lights prescribed by the International Regulations for Preventing Collisions at Sea. Vessels, moored at right angles to the bank, must carry the forward *white* light at the extreme end of the vessel at a sufficient height for it to be clearly visible. 25

Vessels under way in the harbour or in the entrance channels shall conform to the International Regulations for Preventing Collisions at Sea. 30

In the harbour the speed of vessels must be reduced to the lowest limit that will allow them to answer the helm. Captains must not hesitate to stop the engines when passing moored vessels, in order to prevent the carrying away of hawsers and other accidents.

Sounding the steam whistle is only allowed as follows:— 35

1. The signals as laid down in the International Regulations for Preventing Collisions at Sea.

2. Five or six short blasts—I have reduced speed and may have to stop or make fast. This signal must be repeated at short intervals until the vessel following answers by the same signal. 40

3. One long blast—Calls attention.

Sound signals between ships and tugs.

Special regulations are in force for vessels carrying dangerous materials. Such vessels must give notice of their expected time of arrival 24 hours in advance. 45

Quarantine.—The Health officer boards vessels as soon as they enter the port. Vessels are permitted to pass through the Canal in quarantine without communicating with the shore, and passenger steamers and some cargo steamers do so, if plague or cholera exists in

Charts 2573, 2630, 2606, 2158b, 449.

Chart 234.

Egypt. The Canal pilot remains on board during the whole transit of the Canal.

A vessel bound from Suez in quarantine, the period of which expires before arrival at Port Said, will not be permitted to berth elsewhere than in the Outer basin, unless a written statement from the Quarantine Authorities, confirming the expiration of the quarantine period, is received by the Shipping agent.

The quarantine station is situated on the east bank of the Suez canal, between the second and third milestones; there is also a floating quarantine office in Abbas Hilma basin (*Lat. 31° 15' N., Long. 32° 18' E.*).

Town.—The town of Port Said, on the western side of the harbour, is well laid out, the streets being bordered with trees. There is an English hospital, a British seamen's hospital, and an Egyptian Government hospital. Parallel with the railway, which runs between Port Said and Ismailia, is a fresh-water canal. The population, in 1947, was 178,432.

The languages most spoken at Port Said are English, French, Italian, Greek, Arabic, and Maltese. English is very generally understood by Government and other officials.

Port Fuad (Fouad), on the eastern bank at the entrance to the harbour, contains the residences of the Canal Company's employees. It is connected with Port Said by a ferry.

Trade.—The principal exports are cigarettes, oil cake, sugar, eggs, onions and cotton; the chief imports are coal, chandlery, petroleum, and building materials.

Port facilities.—Large repairs to hull and machinery can be undertaken. There is a floating dock (*see* Appendix I), and also several patent slips.

Ample stocks of coal, fuel oil, and diesel oil are maintained. Coal is supplied in baskets at a rate of about 150 tons per hour.

There are eight floating cranes, the largest having a lifting capacity of 150 tons. These are all owned by the Suez Canal Company, and may be operating anywhere in the canal zone. There are also three other cranes, with a lifting capacity of about 10 tons, and fifteen 3 to 5 ton mobile cranes owned by private companies.

Several tugs and numerous lighters are available.

Fresh water is supplied by water-boats equipped with steam pumps.

Fresh provisions are plentiful and ice can also be obtained.

Communications.—There is steamer connection with the principal ports of the Mediterranean, and with Great Britain, the Indian Republic, Pakistan, and the Far East.

Port Said is connected to the Egyptian railway system, and to the general telegraph and telephone systems.

Consul.—A British Consular Officer resides at Port Said.

Deratisation.—*See* page 15.

Climatic table.—*See* page 34.

Chart 2573.

Manzala canal.—A channel, 72 feet (21^m9) wide, with depths of from 4 to 5 feet (1^m2 to 1^m5), has been dredged between Port Said, El Matariya (*Lat. 31° 11' N., Long. 32° 02' E.*) and Shatt Gheit el-Nasara, about a mile eastward of Damietta; a branch channel runs from a point about 4 miles south-eastward of Shatt Gheit el-Nasara, and joins

Charts 2630, 2606, 2158b, 449.

Chart 2573.

the Nile about 2 miles south-westward of Damietta. A regular service of ferry boats runs in conjunction with the railway service between Damietta and Mansura.

The channel is marked by iron and wood piles and is maintained by dredging. The largest vessels using this canal are 115 feet (35^m0) long and 23 feet (7^m0) beam, with a load draught of 4 feet (1^m2).

Chart 233.

Suez canal.—The Suez canal is described in the Red Sea and Gulf of Aden Pilot.

Chart 2573.

Coast.—El Tina (Tineh) bay lies between Port Said and Katib el-Galss, about 40 miles eastward; the shore is very low for a distance of 22 miles south-westward from Katib el-Galss, and consists of a narrow strip of sand separating Sabkhet el-Bardawil, an extensive salt lake, from the sea.

El Tina bay is shallow, with depths of less than 5 fathoms (9^m1) within 5½ miles of the head of the bay.

About 10½ miles south-eastward of Port Said lighthouse, there is a square ruined fort, 30 feet (9^m1) high, which can be identified.

Om Fareg, or the Tanitic mouth, lies about 2½ miles south-south-eastward of the ruined fort, and, about 5 miles farther south-south-eastward, is the Tina, or Pelusiatic mouth.

Katib el-Galss (*Lat. 31° 14' N., Long. 33° 05' E.*) (ancient *Casius Mons*) is a small but remarkable range of sandhills, 198 feet (60^m3) high; here the strip of sand separating Sabkhet el-Bardawil from the sea is a mile wide.

Off-lying dangers.—Depths of 4½ and 5 fathoms (8^m7 and 9^m1) lie about 14 miles north-north-westward of Katib el-Galss, and depths of 5 and 5½ fathoms (9^m1 and 10^m1) are situated within about 3 miles farther westward. Between these shoals and Katib el-Galss there are several shoals with depths of from 13 to 36 feet (4^m0 to 11^m0), the positions of which may best be seen on the chart.

An obstruction was reported, in 1914, to lie about 3 miles north-north-westward of Katib el-Galss, and, in 1925, depths of 3½ fathoms (6^m9) were reported in this vicinity.

Coast.—The coast between Katib el-Galss and Rās el-Abid, about 17½ miles east-south-eastward, is a continuation of the narrow and very low strip of sand separating Sabkhet el-Bardawil from the sea; thence to El' Arish, about 19 miles eastward, the coast is low and sandy. In 1915, there were some huts on the strip of sand 6½ miles eastward of Katib el-Galss. There is a palm grove about 5 miles westward, and a conspicuous sandhill, 450 feet (137^m2) high, about 8 miles south-south-westward, respectively, of El' Arish.

Off-lying shoals.—**Caution.**—Extensive shoals, with depths of from 3 to 6 fathoms (5^m5 to 11^m0), lie within 7½ miles north-north-eastward and 10 miles north-eastward of Katib el-Galss; several 3-fathom (5^m5) patches lie within 4 miles, and depths of 2 fathoms (3^m7) within 1½ miles, of the coast, between Katib el-Galss and Rās el-Abid (*Lat. 31° 10' N., Long. 33° 26' E.*).

In 1944, considerably less water was reported between 8 and 11 miles north-eastward of Katib el-Galss, and depths of 2½ fathoms (4^m6) were reported to lie between 3½ and 4½ miles east-north-eastward of the same point. This part of the coast should be approached with caution.

Charts 2630, 2606, 2158b, 449

Chart 2573.

Coast.—The town of El' Arish is situated on low ground on the banks of the Wadi el' Arish, amidst palm trees and sand dunes, about one mile from the coast. Numerous buildings are, however, visible 5 from seaward and the minaret of the mosque is conspicuous. The Governor of the province of Sinai resides here. Landing can only be effected in good weather, as the coast is very exposed. *See* view facing page 211.

El' Arish is connected to the Egyptian and Palestine railway systems, 10 and to the general telegraph system.

Current.—The current off El' Arish appears to set eastward at a rate of about three-quarters of a knot, decreasing to about half a knot outside the banks.

Caution.—The coast between Port Said and El' Arish, a distance of 15 77 miles, with the exception of Katib el-Galss, is extremely low, with many shoals extending far off it, and navigation requires the greatest caution, particularly in autumn and winter, when north to west winds sometimes blow hard. During fog sounding is the only guide and vessels should not approach the coast within a depth of 10 fathoms 20 (18^m3), and between the meridians of 33° and 33° 20' E. not within a depth of 20 fathoms (36^m6), as there are depths of 10 fathoms (18^m3) close to the outer shoals northward of Katib el-Galss.

For continuation of the coast northward, *see* page 224.

Charts 2630, 2606, 2158b, 449.

CHAPTER IV

SOUTHERN COAST OF TURKEY—KARA BURUN (CAPE ALUPO)
TO BAY OF BASIT

CLIMATE AND WEATHER.—See page 16 *et seq.*

Charts 1604, 872.

RHODES CHANNEL.—**Current.**—**Caution.**—Rhodes channel, between the western end of the southern coast of Turkey and the northern end of Rhodes island, has a least width of $9\frac{1}{2}$ miles; it has considerable depths and is clear of dangers in the fairway. 5

The current usually sets westward. Near Kum burnu (*Lat.* $36^{\circ} 27' N.$, *Long.* $28^{\circ} 14' E.$), the northern extremity of Rhodes island, there is a strong current which, with winds from between North and North-west, tends to set on to the cape; caution is therefore necessary 10 when approaching the cape under such conditions.

In winter, if southerly winds are accompanied by cloudy weather and thick haze, caution is necessary in navigating the channel.

Coast.—Kara burun (Cape Alupo) (ancient *Cynossema prom.*) (*Lat.* $36^{\circ} 33' N.$, *Long.* $28^{\circ} 01' E.$) is the southern extremity of the long and narrow peninsula which separates Hisar Omu körfez and Sombeki körfez, formerly called the Gulfs of Doris and Symi, respectively, from Rhodes channel. The south-eastern coast of the peninsula between Kara burun and Marmaris burnu (Cape Marmarice), about 19 miles north-eastward, is steep and rugged, rising to a range of limestone 20 mountains, about 1,500 feet (457^m2) high. There are numerous ancient and mediaeval ruins on the peninsula.

A sunken rock lies at the base of Kara burun and care must be taken not to round the point too closely.

Bozuk bükü (Port Aplotheke) is entered about 2 miles east-north- 25 eastward of Kara burun, and there are some bold points between. The entrance to the port is about half a mile wide, with considerable depths, decreasing to 11 fathoms (20^m1) near the head, where anchorage may be obtained. A rock, above water, lies close inside the western entrance point, and some sunken rocks lie close to the eastern entrance 30 point; the interior of the harbour is clear of dangers. The ruins of a large fortress stand on a rocky barren ridge northward of the port, and the extensive ruins of the ancient town of Loryma are on the shores around the port.

About half a mile eastward of the eastern entrance point of Bozuk 35

Charts 236, 2836a, 2606, 2158b, 449.

Charts 1604, 872.

bükü, is a point close eastward of which are several rocks and an islet. Çatal ada (Ipsera island), situated a quarter of a mile southward of this point, is separated from the islet by a passage about one cable
5 wide, with a depth of 10 fathoms (18^m3) in mid channel. About 1½ miles north-eastward of this point is the entrance to Serçe bükü (Port Sertchek) (ancient *Sersa*), which is only available for small vessels.

Pınar bükü (Pınarı bay) is contained between Serçe bükü and
10 Pınar burnu (Cape Pınarı), about 2 miles eastward; its shores are steep and rocky, and there is no anchorage. The ruins of the ancient Phœnix lie on the summit of a mountain, 1,780 feet (542^m5) high, situated 2 miles north-north-eastward of Pınar burnu.

Chart 1667.

15 Kum burnu (*Lat. 36° 27' N., Long. 28° 14' E.*), the northern extremity of Rhodes island, is low, sandy, and steep-to. A prominent hotel with a dome stands about 2 cables southward of the lighthouse. Landing may be effected in ordinary weather on either side of the cape. For description of Rhodes island, see *Mediterranean Pilot*, Vol. IV.

20 *Chart 1604.*

Kızıl ada (Elesa island) (ancient *Elæussa*) lies about 2 miles north-eastward of Pınar burun and 3 cables offshore, with a deep and clear passage between it and the coast.

The coast between the point abreast Kızıl ada and Akyar burnu
25 (Cape Aspro-mitas), 7½ miles north-eastward, continues high, rugged, and steep-to.

Anchorage may be obtained under the rocky Arab (Arabah) adası, 3 miles north-north-eastward of Kızıl ada, but it is only available for boats. See views facing this page.

30 *Chart 1545.*

Chiflik island (ancient *Phalarus*) lies in the entrance to a small but snug cove, situated about 1½ miles north-north-eastward of Akyar burnu; the cove, which has depths in it of from 3 to 13 fathoms (5^m5 to 23^m8), is frequented by boats. Between Chiflik island and Pandion

35 point, about 2 miles eastward, the coast forms a bay, the shores of which are high, precipitous, and steep-to, but foul ground extends a short distance off Pandion point.

Marmaris burnu (Cape Marmarice) (ancient *Posidium prom*), one mile north-eastward of Pandion point, is of moderate height, but a
40 picturesque mountainous range rises immediately behind it, attaining an elevation of from 2,700 to 2,900 feet (823^m0 to 883^m9). See view facing page 133.

Chart 1667.

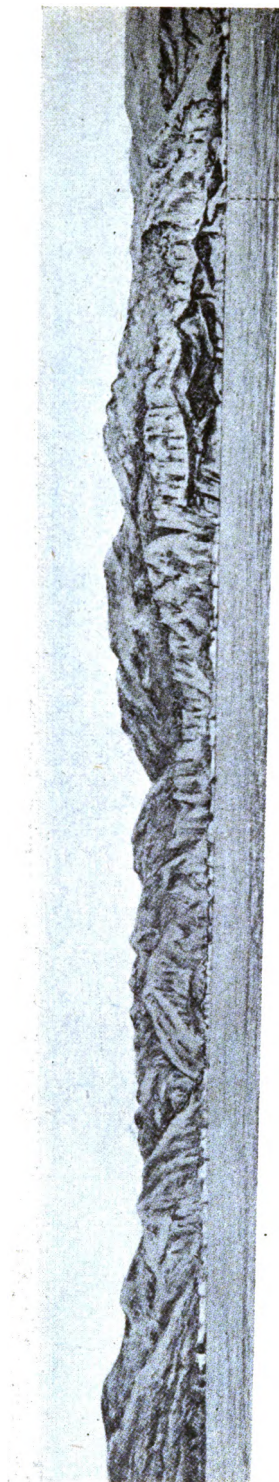
Lights.—Signal station.—A light (*Lat. 36° 27' N., Long. 28° 14' E.*)
45 is exhibited, at an elevation of 55 feet (16^m8), from the top of the aquarium on Kum burnu.

There is a signal station situated about one mile south-westward of this lighthouse.

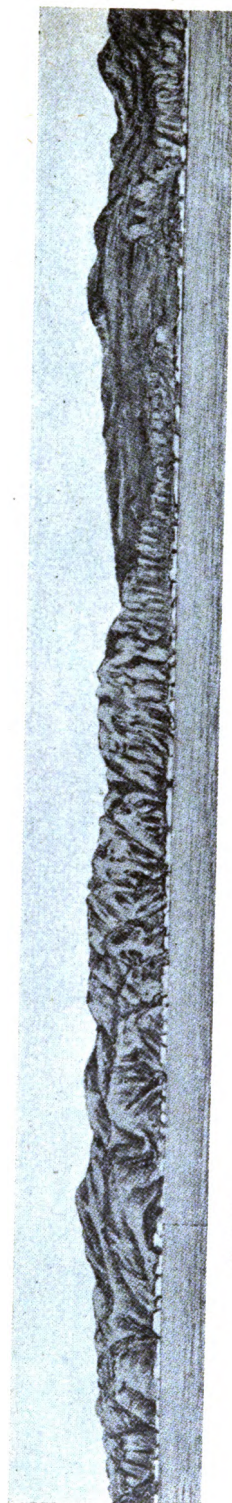
A light is exhibited, at an elevation of 82 feet (25^m0), from a white
50 tower, 82 feet (25^m0) in height, on St. Nicola tower, situated about half a mile south-eastward of Kum burnu lighthouse.

Two lights, vertically disposed, are exhibited, the upper light at an elevation of 128 feet (39^m0), from a white, iron mast, on a white dwelling, situated on Marmaris burnu.

Charts 236, 2606, 2158b, 449.

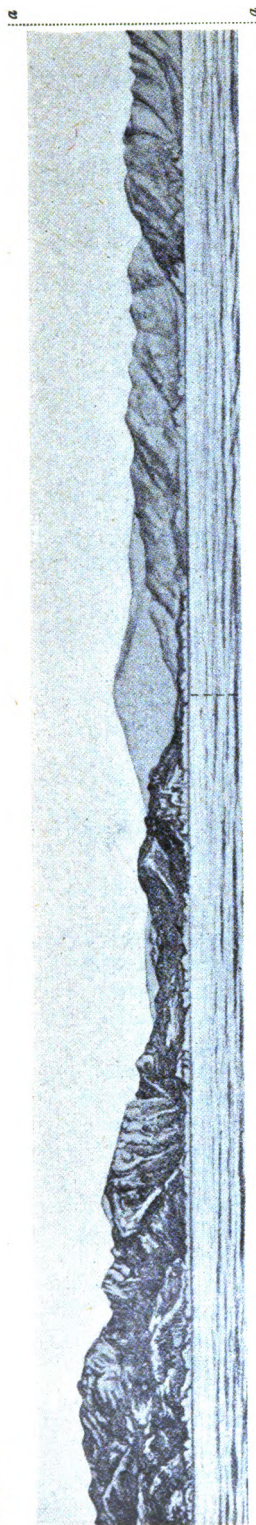


*Akyar burnu,
bearing 350°, distant 7 miles.*



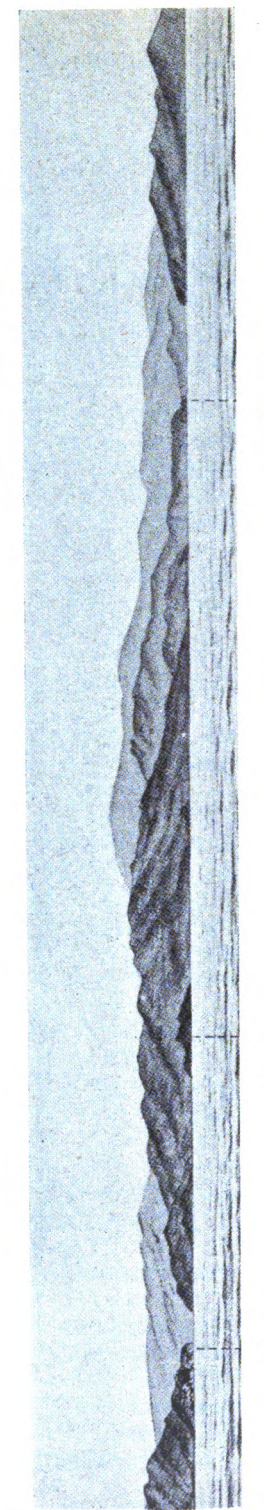
*Kızıldağ,
bearing 287°, distant 6 miles.*

Two views of the southern coast of Turkey south-westward of Kadirga burnu.
(Originals dated 1912.)



*Marmaris burnu,
bearing 012°, distant 10 miles.*

Entrance to Karaağaç liman.



*Turnalı burnu.
Yılancık ada.*

*View, in two parts, of approaches to Marmaris and Karaağaç liman.
(Original dated 1941.)*

Kızıl burun.



Entrance to Fethiye körfezi.

*Fethiye körfezi to Kelemiş burnu from south-south-eastward, distant 19 miles.
(Original dated prior to 1920.)*

Kelemiş burnu.

Chart 1545.

COAST.—Immediately northward of Marmaris burnu there is a small bight, the entrance to which is about 3 cables wide, and 8 cables north-north-westward of its northern entrance point is Paridion point.

Between Paridion point and the south-eastern entrance point of Kumlu bükü (Kumlubek bay), about 3 cables west-north-westward, are some rocks above water, lying about one cable offshore.

Anchorage.—Good anchorage may be obtained in Kumlu bükü, in depths of from 9 to 17 fathoms (16^m5 to 31^m1), sand, sheltered from north-west, through west, to south. A heavy swell, however, sets in with south-westerly gales. The ruins of Asarjik (ancient *Samus*) are situated on a cliff on Hisar burnu, the north-western entrance point of Kumlu bükü (*Lat.* 36° 46' N., *Long.* 28° 19' E.).

Coast.—A out 4 cables north-north-westward of Hisar burnu is a high rocky point, with shoal water extending about 2 cables northward from the coast 2 cables north-westward of it.

Kargi adası (Karghi Adassi), an islet, 39 feet (11^m9) high, and steep-to, except on its southern side, lies about a quarter of a mile eastward of the high rocky point mentioned above. About 12 cables north-westward of Kargi adası there is a small, well-sheltered cove, known as Turunc bükü, which is frequented by coasting vessels. From this cove to Sarı burnu, the western entrance point of Marmaris liman, about three-quarters of a mile northward, the coast is indented, with rocky points between the indentations. See view facing this page.

Marmaris liman.—Marmaris (Marmarice) liman (ancient *Physcus*) is protected from the southward by Ada (Nimada) peninsula, the southern extremity of which is Alkaya burnu (Red Cliff point), lying 3½ miles northward of Marmaris burnu, and by Keçi adası (Passage island), situated westward of Ada peninsula. The harbour is land-locked and affords secure anchorage, with good holding ground, in depths of from 7 to 20 fathoms (12^m8 to 36^m6); the shores are steep-to and the harbour is clear of dangers, except on the north-western side, where depths of less than 3 fathoms (5^m5) extend 3 cables offshore, in places.

The land on the western side of the entrance is high and picturesque, but the north-western shore is bounded by a plain, with several small streams running through it in the winter, but which are nearly dry during the summer.

Ada peninsula rises in the middle to an elevation of 1,354 feet (412^m7), and is connected to the eastern shore by an isthmus of shingle, about 250 feet (76^m2) wide. The hill is covered with pine trees, and on its summit stand the ruins of a fortress.

Keçi adası (*Lat.* 36° 48' N., *Long.* 28° 18' E.), 603 feet (183^m8) high, separates East and West passes. On the western side of the island, 4 cables westward of the above-mentioned summit, are the ruins of a fortress. An islet, the southern extremity of which is known as Ada (Adassi) burnu, and on which there is a light-structure, lies close southward of the southern extremity of Keçi adası.

Bedir ada or Uzun ada (Long island), which lies about 2 cables northward of the centre of Ada peninsula, is steep-to, and the passage between it and the peninsula has depths of from 13 to 20 fathoms (23^m8 to 36^m6), and is clear of dangers in the fairway.

Entrances.—East pass, which is to be preferred, leads between Ada peninsula and Keçi adası, and has a least width of 4 cables; its shores

Charts 2630, 2606, 2158b, 449.

Chart 1545.

are high, precipitous, and steep-to, except for a rocky spit which extends half a cable from the eastern side of the island, about $4\frac{1}{2}$ cables northward of Ada burnu.

- 5 West pass is tortuous, and Kaia rock, above water, lies nearly in mid-channel, but it is otherwise deep and clear of dangers to within about one cable of its shores; the pass, eastward and northward of Kaia rock, has a least width of about $2\frac{1}{2}$ cables.

Light.—Keçi adası light is exhibited, at an elevation of 102 feet (31^m1), from a white iron mast on a white dwelling, situated on Ada burnu.

Marmaris.—The town of Marmaris (*Lat.* $36^{\circ} 51' N.$, *Long.* $28^{\circ} 19' E.$) is situated at the head of the harbour on a rocky eminence in the centre of a very fertile, though sparsely, populated district; the
15 mountains in the vicinity are covered with pine trees. A conspicuous minaret stands in the northern part of the town, and the following other objects are prominent and easily identified:—A red mound, 217 feet (66^m1) high, situated about half a mile northward of Town point, the southern extremity of the peninsula on which the town
20 stands; the barracks, with a red roof, about half a mile westward of Town point, and an ancient fort on a hill, about 2 miles north-north-westward of Town point.

There is a mole, with a depth of 4 feet (1^m2) alongside, situated on the western side of the town.

- 25 The principal productions are honey, turpentine, and timber. Fresh meat and vegetables can be obtained in small quantities. Marmaris is connected to the general telegraph system.

Coast.—Yalancı boğaz (False bay), on the eastern side of Ada peninsula, and southward of the isthmus joining the peninsula to the
30 mainland, has considerable depths. When approaching Marmaris liman at night, the lights in the town, or from vessels in the harbour, can be seen over the isthmus.

Black rock, above water, lies about three-quarters of a cable offshore and $3\frac{1}{2}$ miles eastward of Kütück (İrtick) burun, the south-eastern
35 point of Ada peninsula; foul ground encircles this rock, and extends eastward for one cable, and also north-eastward to the coast. Turnalı burnu (Cape Chatal) lies about $1\frac{1}{2}$ miles eastward of Black rock.

Off-lying islands and dangers.—Edmonds rock (*Lat.* $36^{\circ} 47' N.$, *Long.* $28^{\circ} 26' E.$), with a least depth of 2 feet (0^m6) over it, and on
40 which the sea usually breaks, lies about one mile south-westward of Turnalı burnu.

A current, varying in direction, has been observed to set over Edmonds rock, at a rate of from half a knot to $1\frac{1}{2}$ knots.

Yılancı adası (Linosa island) (ancient *Rhodussa*), $1\frac{1}{2}$ miles south-
45 eastward of Turnalı burnu, is 327 feet (99^m7) high, and steep-to. See view facing page 133.

Ocean bank, with a depth over it of 19 fathoms (34^m7), and steep-to, was reported, in 1909, to lie about $1\frac{1}{2}$ miles south-south-eastward of the south-eastern point of Yılancı adası.

50 **Coast.**—Between Turnalı burnu and Kızıl (Inek) burun, the western entrance point of Karaağaç liman (Karaghatch harbour), $3\frac{1}{2}$ miles north-north-eastward, the coast is bordered by rocks and shoal water, which extend one cable offshore, in places. Some high conical rocks extend one cable eastward of a point 6 cables southward

Chart 1545.

of Kızıl burun ; foul ground extends about half a cable eastward of these rocks.

Boz (Skizo) burun, on the eastern side of the channel leading to Karaağaç liman, lies 3 miles north-eastward of Turnalı burnu. The coast between Boz burun and Koïoun burun, about $2\frac{1}{2}$ miles northward, is fringed by foul ground, which extends about half a cable offshore, in places.

Karaağaç liman.—Karaağaç liman (Karaghatch harbour) (ancient *Cressa*) is separated from Marmaris liman by a mountainous peninsula. The harbour affords secure anchorage, in depths of from 10 to 25 fathoms (18^m3 to 45^m7), with good holding ground. Yörük bükü (Uruk cove), on the northern side, is well sheltered. See view facing page 133.

West islet, about 2 miles westward of Kızıl burun, and three-quarters of a cable offshore, is surrounded by foul ground and shoal water, which extend half a cable eastward and also between the islet and the south-western shore of the harbour.

Two rocks lie southward of a point on the northern shore of the harbour, situated about $1\frac{1}{2}$ miles north-north-eastward of Kızıl burun (*Lat.* $36^\circ 50' N.$, *Long.* $28^\circ 28' E.$) ; the inner rock is 12 feet (3^m7) high, and the outer one, which is $1\frac{1}{2}$ cables from the point, is 2 feet (0^m6) high, with shoal water between it and the inner rock.

East islet, three-quarters of a mile north-north-westward of Koïoun burun, and one cable from the northern shore, is 191 feet (58^m2) high, and bordered by shallow water, which extends half a cable offshore ; there is foul ground between the islet and the northern shore.

A bay, with depths in it of from 12 to 21 fathoms (21^m9 to 38^m4), lies eastward of East islet, and another bay, with depths in it of from 7 to 18 fathoms (12^m8 to 32^m9), lies northward of the islet.

Coast.—Skizo bay, known locally as Dereği, is contained between Boz burun and a point about $1\frac{1}{2}$ miles south-eastward. There is a sandy beach at its head, off which good anchorage might be obtained in south-easterly winds, but the bay is open to the south-westward. About one mile south-eastward of the southern entrance point of Skizo bay is Küçük (Orta) burun, $1\frac{1}{2}$ cables south-south-westward of which there is a rock, awash. Kezil burnu lies about $1\frac{1}{2}$ miles east-south-eastward of Küçük burun.

Chart 1886.

Köyceğiz körfezi.—**Light.**—Köyceğiz körfezi (Keugezi bay), is contained between Kezil burnu (*Lat.* $36^\circ 47' N.$, *Long.* $28^\circ 35' E.$) and a point about $2\frac{1}{2}$ miles east-north-eastward, and has considerable depths. It is open to the southward but small vessels may obtain a safe anchorage in any weather in Ekinçik (Ekinjik) limanı, at the head of the bay.

Dalyan island, on the south-western extremity of which stands a lighthouse, lies close southward of the eastern entrance point of the bay and off the mouth of Köyceğiz çayı (Keugezi river). On the western bank of this river, about $2\frac{1}{2}$ miles inland, stand the ruins of the ancient city of *Caunus* ; the walls and rock tombs of the city are prominent from seaward.

A light is exhibited, at an elevation of 115 feet (35^m0), from a white tower, situated on the south-western extremity of Dalyan island.

The mouth of Köyceğiz çayı, which may be identified by some

Charts 236, 2606, 2158b, 449.

Chart 1886.

reddish-coloured rock on its western entrance point, is about 100 feet (30^m5) wide. The river connects, through marsh and swamp, with a large lake, known as Köyceğiz Göl, about 4 miles north-north-eastward of its mouth.

Köyceğiz Göl, the water of which is brackish, has depths in it of from 3 to 14 fathoms (5^m5 to 25^m6). Several streams flow into it the largest of which, Yuvalaki chai, of considerable size in winter, enters the lake on its south-eastern side. A small village stands on the north-eastern shore of the lake.

Good anchorage may be obtained, during the summer, near the islet off the mouth of Köyceğiz çayı, in depths of from 3 to 9 fathoms (5^m5 to 16^m5), sand and mud; near the islet the depths decrease gradually to the shore.

Coast.—The coast between the eastern entrance point of Köyceğiz körfezi and Dişi Bilmez burnu (Cape Kapnia), about 6½ miles southward, is indented by three bays, which are separated by bold rocky points. In the northernmost of these bays, contained between the mouth of Köyceğiz çayı and a point 2¼ miles south-south-eastward, the depths shoal gradually but there is foul ground near the south-eastern corner of the bay. The narrow projection which separates the two southern bays is known as Glossa burun.

Off-lying shoal.—A 15-fathom (27^m4) shoal lies about 1¼ miles southward of the eastern entrance point of Köyceğiz körfezi.

Coast.—Dişi Bilmez burnu (*Lat.* 36° 42' N., *Long.* 28° 40' E.) rises steeply to an elevation of 1,758 feet (527^m0) about half a mile northward. This cape and Kara (Seira) burun, about 2 miles eastward, are the entrance points of a bay which has considerable depths but affords no anchorage.

Dalamon бүкү, or Sari su limani, lies between Kara burun and Akça (Sphena) burun, 6½ miles south-eastward. About one mile eastward of Kara burun, and 3 cables offshore, is Baba (Papaz) adası, on the summit of which is a large brick pyramid. On the adjacent coast of the mainland there are a number of Hellenic and mediæval ruins.

Small vessels may obtain shelter between Baba adası and the mainland but southerly gales send in a heavy swell.

The shore of Dalamon бүкү, though low, is steep-to, but shoal water extends about 2 cables off the north-eastern shore near the mouth of Dalamon nehri. This river, which is very rapid, passes through an extensive plain, and enters the sea about 1½ miles east-north-eastward of Baba adası.

Off-lying islets.—Nar (Rothea) adası, 106 feet (32^m3) high, and steep-to, lies 2 miles south-westward of Akça burun.

Peksimet (Paximadi) adası, 86 feet (26^m2) high, and steep-to, lies about 1¼ miles south-westward of Kurt oğlu (Suvela) burnu, situated 4¾ miles south-south-eastward of Akça burun. There are irregular depths between the islet and the cape.

FETHIYE KÖRFEZİ.—Fethiye körfezi (Gulf of Fethieh) (ancient *Glaucus sinus*) is entered between Kurt oğlu burnu and Iblis burnu (Cape Angistro), 8½ miles south-eastward. See view A on chart 236.

Kurt oğlu burnu (ancient *Artemisium prom*) (*Lat.* 36° 35' N., *Long.* 28° 54' E.) is the southern extremity of a rugged and bold peninsula which rises to Kapi dağ (Mount Suvela), 1,400 feet (426^m7) high, about

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Chart 1886.

1½ miles northward of the cape. The north-western side of this peninsula is connected to the mainland by a narrow isthmus, and from its north-eastern side an irregular neck of land extends about 2 miles north-eastward; on the western side of this neck of land are several 5 coves, but all have too great depths to afford anchorage, with the exception of Kapi cove, the northernmost.

Taxis dağ, 1,770 feet (539^m5) high, situated on the mainland on the western side of the gulf, about 4 miles northward of Kurt oğlu burnu, is the southernmost summit of a mountain range extending northward 10 for several miles. Flat hill, a prominent peak in this range, lies about 2 miles northward of Taxis dağ.

On the northern mainland of the gulf, about 11½ miles north-eastward of Flat hill, is Red Peak, 3,230 feet (984^m5) high.

Iblis burnu (Cape Angistro) is the western extremity of a peninsula; 15 between it and Dactylo burnu, about 7 miles north-eastward, the coast forms two bays, separated by a projection, 1,758 feet (537^m0) high, and is bold and free from dangers.

The southern of the above-mentioned bays, known as Gokceğimile körfezi, is contained between Iblis burnu and Merdivenli burnu, about 20 2¾ miles north-north-eastward; an islet lies on the southern side of this bay, about 1½ miles north-eastward of Iblis burnu. The northern bay is contained between Sahin burnu, about 2¼ miles north-north-eastward of Merdivenli burnu, and Kul Allah burnu, 2 miles farther north-eastward. About midway between Merdivenli burnu and Sahin 25 burnu is a point known as Boz burnu.

Islands and dangers.—Domuz (Iero) adası, close northward of the neck of land extending north-eastward from Kapi dağ, is 850 feet (259^m1) high; the passage between them is about 400 feet (121^m9) wide, with a depth of 9 fathoms (16^m5) in mid-channel, and is clear of 30 dangers. A rocky shoal, with a least depth of 5 fathoms (9^m1) over it, lies about half a mile south-eastward of the southern extremity of Domuz adası (*Lat.* 36° 39' N., *Long.* 28° 58' E.).

Tersane (Tersaneh) adası, the summit of which, 805 feet (245^m4) high, is a cultivated plain, lies about 2 cables eastward of Domuz 35 adası, with a least depth of 25 fathoms (45^m7) in the fairway between the two islands; an islet lies in mid-channel at the northern end of this passage and there is a 6-fathom (11^m0) shoal about 2½ cables northward of the islet.

Good anchorage may be obtained in a small harbour on the north- 40 western side of Tersane adası, where there is a small village standing amongst extensive ruins.

Yassica adalar (Stavro islands), consisting of several islands and rocks, lie one mile northward of Tersane adası, with a deep channel between. Kızlan adası (St. Kiriaki) lies about half a mile northward 45 of Yassica adalar.

Isabel rock consists of two rocky patches, with a least depth of 2½ fathoms (4^m6) over them, and steep-to, lying about 2¼ miles eastward of the eastern extremity of Tersane adası. The northern extremity of Tersane adası in line with the southern part of Flat hill, bearing 50 271°, leads northward, and the centre of Katranca (Avthoki) adası (*see* page 138) in line with Red peak (*see* above), bearing about 019°, leads eastward of Isabel rock.

Kızıl adalar (Kazil islands) are a rocky group lying in the eastern

Charts 236, 2606, 2158b, 449.

Chart 1886.

part of the gulf; the southern and largest island is 530 feet (161^m5) high, and a lighthouse stands on its southern extremity. A rock, on which the sea usually breaks, lies about a quarter of a mile west-
 5 north-westward of the northernmost islet of the group, situated about 1½ miles north-north-westward of the lighthouse.

Katrancı adası (Avthoki) lies about 1½ miles north-eastward of Isabel rock and is rocky and barren; foul ground extends about 2 cables from its south-eastern end. In the channel between this
 10 island and Kızıl adalar the channel is rocky and uneven, and a 7½-fathom (13^m7) shoal exists in a position three-quarters of a mile south-eastward of Katrancı adası; there is also a 12-fathom (21^m9) patch half a mile southward of the island.

Batraki rocks (*Lat.* 36° 40' N., *Long.* 29° 09' E.), a few feet above
 15 water and steep-to, lie about 2½ miles east-north-eastward of Kızıl adalar lighthouse. About 3 cables south-eastward of these rocks is a rocky shoal, over which there is a depth of 3 fathoms (5^m5).

Light.—A light is exhibited, at an elevation of 105 feet (32^m0), from a white stone tower, 41 feet (12^m5) in height, situated on the
 20 southern extremity of the Kızıl adalar.

Anchorage.—Anchorage may be obtained, in depths of from 22 to 29 fathoms (40^m2 to 53^m0), between the Kızıl adalar and the shore north-eastward of them, with good holding ground and well sheltered from the southward.

25 **Skoepa bay.**—Skoepa bay lies between the chain of islands, extending north-north-eastward from Domuz adası (page 137), and the mainland westward of it. The depths are too great to afford anchorage, except in several creeks where small craft can shelter. Mediæval remains are numerous in this locality.

30 North-westward of Tersane ada (*Lat.* 36° 41' N., *Long.* 28° 58' E.) the bottom is uneven, and shoals of 16 fathoms (29^m3), 14 fathoms (25^m6), and 10 fathoms (18^m3) exist about three-quarters of a mile north-westward, 1½ and 1¼ miles west-north-westward, respectively, of the northern extremity of the island.

35 Between Yassica adalar and the mainland a 3½-fathom (6^m4) shoal lies in the fairway, about three-quarters of a mile north-westward of the southernmost extremity of these islands. An islet, with a group of above-water and sunken rocks 2 cables northward of it, stands in the fairway about a quarter of a mile northward of this 3½-fathom (6^m4)
 40 shoal.

Chart 1886, plan of Gocek liman.

Gocek liman.—**Directions.**—**Pilot.**—Gocek liman, situated in the northern part of Skoepa bay, is used for the export of locally mined chrome ore. The eastern part is known as the outer harbour and the
 45 western part, which is well sheltered, as the inner harbour

Gocek liman should be approached between Kızılan adası. A pilot can be obtained from Fethiye (page 140).

Wharves.—There are two wharves at present in use—Turkish Chrome Company wharf in the outer harbour, and Paterson's wharf
 50 in the inner harbour. Vessels loading at Paterson's wharf should moor stern on to the wharf, which has a depth of 9 fathoms (16^m5) about 200 feet (61^m0) seaward of it. Mooring bollards are being constructed on either side of the inner harbour.

Town.—The town of Gocek lies on the eastern shore of the outer

Charts 236, 2606, 2159b, 449.

Chart 1886, plan of Gocek liman.

harbour, about one mile northward of Kızlan adası. It is connected to the general telegraph and telephone systems, and by road with Fethiye. There is also communication with Fethiye by motor boat.

Chart 1886.

Head of Fethiye körfezi.—A high rugged cape lies 8 cables east-south-eastward of the eastern extremity of Kızlan adası and the Inlice (Iniji) çayı flows south-westward into a small bay eastward of it. The valley through which this river runs is well cultivated and, on a hill on the north-western side of the valley, about 2 miles within the river mouth, are the ruins of an ancient city, probably *Dædala*, where numerous tombs, hewn out of the rock in the Lycian style, are to be seen, and also the remains of immense walls.

The coast between the mouth of the Inlice çayı and a point $1\frac{1}{2}$ miles south-eastward, consists of high cliffs which are steep-to and rise to the hills about one mile inland. From this point the cliffs trend east-north-eastward and form the northern shore of a small bight, into the head of which a river flows.

A moderately high point, with foul ground extending about one cable from its western and southern sides, separates the bight just mentioned from another bight south-eastward. From the south-eastern point of this latter bight the coast becomes low and marshy to Eğrikum burnu (*Lat. 36° 39' N., Long. 29° 10' E.*), the eastern entrance point of Fethiye limanı.

Chart 1886, plan of Fethiye harbour.

Fethiye limanı. — Dangers. — Light-buoy.—Fethiye limanı (ancient *Telmissus*) situated in the eastern part of Fethiye Körfezi, is landlocked and affords complete shelter.

Meğri adası (Cavalière island), 110 feet (33^m5) high, and covered with mediæval ruins, lies across the entrance to the harbour, leaving a passage on either side. The south-western passage is the wider and better of the two, but both are safe and clear of dangers.

On the eastern side of the harbour the shore is low and marshy, and a shoal of mud, which dries in places, extends from it for a distance of 2 cables in the northern and 6 cables in the southern part, abreast the town. Its western limit is marked by a white iron tower, situated about one mile south-eastward of Meğri adası light-structure, and by a cylindrical buoy, from which a *fixed red* light is occasionally exhibited, moored about 2 cables north-north-westward of the north-western extremity of the town.

Sunk rock, surmounted by a white iron tower on a concrete base, lies $4\frac{1}{2}$ cables eastward of Dactylo burun, and $1\frac{1}{2}$ cables offshore.

Lights.—A light is exhibited, at an elevation of 56 feet (17^m1), from a white iron column surrounded by a wall on the southern extremity of Meğri adası.

A light is exhibited, at an elevation of 28 feet (7^m0), from a white concrete tower situated on Sunk rock.

A light is exhibited, at an elevation of 23 feet (7^m0), from the white concrete tower, situated about one mile south-eastward of Meğri adası light-structure, mentioned above.

Anchorages.—Directions.—Anchorage may be obtained, in depths of from 7 to 10 fathoms (12^m8 to 18^m3), stiff mud, in any part of the harbour clear of the shoal extending from the eastern shore.

A vessel should approach Fethiye limanı on an east-north-easterly

Charts 236, 2606, 2158b, 449.

Chart 1886, plan of Fethieh harbour.

course, keeping Kurt oğlu burnu open northward of Dactylo burnu until Paçarız (Drepanaki) burnu (*Lat.* $36^{\circ} 38' N.$, *Long.* $29^{\circ} 10' E.$), situated about $1\frac{1}{2}$ miles east-south-eastward of Dactylo burnu, bears
 5 123° , or is well open north-eastward of the point west-north-westward of it. This leads about one cable north-eastward of Sunk rock. When abeam of Sunk rock she should alter course eastward and pass between Fethiye adası and Paçarız burnu, thence steer as convenient for the anchorage, keeping close to the western shore to avoid the shoal extend-
 10 ing from the eastern shore, previously described.

Owing to the imperfect nature of the survey the plan on chart 1886 must be used with caution.

Jetty.—A jetty, about 250 feet (76^m2) long, consisting of a large hulk filled with rock, surmounted by a platform standing between
 15 6 and 8 feet (1^m8 and 2^m4) above sea level, is situated at the south-western extremity of Eğrikum burnu, the eastern entrance point of the harbour.

In 1949, it was reported that the depth alongside was not less than 24 feet (7^m3), and that vessels of from 7,000 to 10,000 tons could
 20 be berthed.

Hauling-off buoys are moored off the ends of the jetty, which is used for loading chrome ore.

Town.—Quay.—Fethiye (Fethieh), which had, in 1948, an estimated population of 5,000, lies on the southern shore of the harbour
 25 and is, for the most part, built on reclaimed land. The seaward end of the town forms a quay, the north-western face of which has depths of from $1\frac{1}{2}$ to 2 fathoms (2^m7 to 3^m7) alongside, increasing to 4 fathoms (7^m3) a short distance offshore. The northern face of the quay, however, has a depth of 3 feet (0^m9), or less, alongside. Large vessels
 30 anchor off and secure their sterns to ringbolts on the quay.

Port facilities.—Provisions can be obtained and the harbour abounds with fish. Water is laid on to the quay.

There is a hospital in the town and a resident Port Health Officer.

Communications.—Fethiye is connected to the general telegraph
 35 and telephone systems, and is linked by road with Gocek and also by a motor boat service.

A light railway runs from the jetty to the Chrome mines, situated in the mountains northward of the town.

There is regular steamer communication with other Turkish ports.

40 **Deratisation.**—See page 15.

Chart 1886.

COAST.—Karaca ören adaları (Karazora island) (*Lat.* $36^{\circ} 32' N.$, *Long.* $29^{\circ} 07' E.$), $1\frac{1}{2}$ cables south-eastward of the eastern extremity of the peninsula, on the eastern side of the entrance to Fethiye körfezi,
 45 and Kemılı adası (St. Nikolo island), about three-quarters of a mile farther north-eastward, are covered with ruins. Rocky foul ground extends between the south-eastern point of the peninsula and the southern extremity of Karaca ören adaları. In the channel which runs east and west, and is about one cable wide between Kemılı adası
 50 and the mainland, there is good shelter for small craft.

Alikünbed (Levisi) liman, entered about half a mile north-eastward of Kemılı adası, is open to the southward; foul ground extends from its eastern shore.

Charts 2606, 2158b, 449.

Chart 1886.

Yogun (Simbalu) cove, entered about half a mile northward of Yogun (Simbalu) burnu, about $2\frac{1}{2}$ miles eastward of Kemılı adası, affords secure anchorage in depths of from 15 to 20 fathoms (27^m4 to 36^m6), mud. The entrance, however, though easy of access, is only a quarter of a cable wide, with a depth in it of 19 feet (5^m8). About $1\frac{1}{2}$ miles north-north-westward of the head of this cove is the town of Alikünbed (Levisi), situated on the southern side of a well-cultivated, elevated plain, which produces good wine and figs.

Chart 236.

The coast between Yogun cove and Yedi burun basi, the north-westernmost of the Seven capes, about 10 miles southward, is lofty and bold, with several creeks in the southern part which afford anchorage to small craft with local knowledge.

The Seven capes are the extremities of the spurs from Sandak (San) dağ, a range of rugged mountains, which attain an elevation of 3,300 feet ($1,005^m8$), and run parallel and close to the coast for about 7 miles. They are named, from north-west to south-east:—Yedi burun basi, Kotü burnu, Sancak burnu, Inkakalar burnu, Yassi burnu, Kilic burnu and Zeytun burnu. See view facing page 133.

A sandy beach, with shoal water extending about three-quarters of a mile offshore, trends south-eastward from Zeytun burnu to Koca çay (Etchen chai) (ancient *Xanthus Fl*), a distance of $4\frac{1}{2}$ miles.

The ruins of the ancient city and port of *Patara* lie about $1\frac{1}{2}$ miles south-eastward of Koca çay, and $2\frac{1}{2}$ miles farther south-eastward is the high Keleş or Yah (Kalamaki) burnu (*Lat.* $36^{\circ} 13' N.$, *Long.* $29^{\circ} 25' E.$).

Çatal (Volos) ada and Üvendire (Okhendra) adası lie about three-quarters of a mile southward of Keleş burnu. See views A, B, and D on chart 236.

Keleş (Kalamaki) limanı, is contained between Keleş burnu and Ince burun, 3 miles eastward, but affords indifferent anchorage on account of its considerable depths and exposure to the southward; its shores are steep-to, but there are some rocks near the western shore. The town of Kalkan stands on the north-eastern shore of the bay.

Jura shoal, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies a quarter of a mile south-south-westward of the eastern entrance point of Keleş limanı. The coast from this point to the head of Port Vathi, 11 miles eastward, is high and rugged.

Off-lying islands and dangers.—Boğacık and Heybeli ada (Phournaki islands) lie about $1\frac{1}{2}$ miles south-eastward of the eastern entrance point of Keleş limanı; Heybeli ada, the outer island, lies about $1\frac{1}{2}$ miles offshore. Ufak (Prason) ada, which is steep-to, lies about $1\frac{1}{2}$ miles south-south-eastward of Heybeli ada.

A rock, with a depth of less than 6 feet (1^m8) over it, lies about 2 miles south-eastward of Boğacık ada, and one mile offshore. Üvendire adası, bearing 298° , open south-westward of Heybeli ada, leads south-westward of this rock.

A shoal, with a depth of $5\frac{1}{2}$ fathoms (10^m1) over it, lies about one mile east-north-eastward of Heybeli ada (*Lat.* $36^{\circ} 11' N.$, *Long.* $29^{\circ} 30' E.$).

St. Georgio island lies about 2 miles south-eastward of Ufak ada, and is steep-to; on its southern side there is an inlet with considerable

Chart 236.

depths, and on its northern side there is a small bay with a sandy beach.

Tragonera islet lies close off the eastern extremity of St. Georgio island. A shoal, with a depth of 8 fathoms (14^m6), lies about one mile eastward of Tragonera islet.

Körmenli (Marathi) adası lies about 2½ miles north-eastward of Tragonera islet. Voutzaki rocks, which are low and steep-to, lie about three-quarters of a mile south-south-eastward of Körmenli adası.

Port Vathi.—Port Vathi lies between the mainland and Vathi peninsula, which extends 2½ miles west-south-westward. The port has a least width of a quarter of a mile, and there are two rocks, above water, in the middle of the entrance. These rocks can be passed on either side at a distance of half a cable, but the channel southward of them is the better of the two. There is a least depth of 5 fathoms (9^m1) in the outer part of the port, and 7 fathoms (12^m8) in the inner part.

A sheltered anchorage may be obtained, by vessels with local knowledge, in a depth of about 11 fathoms (20^m1), at the head of the port. North-north-easterly winds blow with great force off the mountains.

Gulf of Kastelorizo.—The Gulf of Kastelorizo lies between Vathi peninsula on the north, the mainland on the east, and Kastelorizo island, situated about 1½ miles southward of Ada burnu (Point Vathi), the western extremity of Vathi peninsula, on the west. Several channels lead into the gulf, the best being Vathi channel, between Vathi peninsula and Kastelorizo island.

Port Longos, on the northern side of the gulf, and entered 1½ miles eastward of Ada burnu (*Lat.* 36° 11' N., *Long.* 29° 38' E.), affords anchorage to small vessels with local knowledge. An islet lies on the southern side of the port

Bayındır limanı (Port Sevedo), in the north-eastern corner of the gulf, is more sheltered than Port Longos, but the depths are considerable, and a spit extends about one cable north-eastward from the southern entrance point. The port is easy to enter and affords good shelter.

From the head of Bayındır limanı a tongue of land projects like a pier, and there is a depth of 5 fathoms (9^m1) close alongside the rocks at its extremity. Vessels either anchor or moor with hawsers to the shore.

Kastelorizo island (ancient *Cisthene* or *Megiste*) is 825 feet (251^m5) high. See views B and D on chart 236. The island has a special Customs system of its own.

A submarine cable, marked by a post, lands at San Stephano point, a double headland, which is the northern point of Kastelorizo island. See pages 13, 14.

Hypsili island, 600 feet (182^m9) high, and steep-to, lies in the entrance to the gulf, about 2½ miles south-eastward of Kastelorizo island; there are several islets between it and the mainland, the largest of which, known as Sariod adası (Dash island) lies about one mile north-eastward.

Light.—A light (*Lat.* 36° 06' N., *Long.* 29° 41' E.) is exhibited, at an elevation of 279 feet (85^m0), from a white masonry tower, 33 feet (10^m1) in height, on the south-western extremity of Hypsili island.

Chart 236, plan of Kastelorizo roadstead and harbour.

Kastelorizo harbour.—Kastelorizo harbour, on the north-eastern

Chart 236, plan of Kastelorizo roadstead and harbour.

side of Kastelorizo island, is situated at the head of a bight which lies about one mile south-westward of the double headland of San Stephano point. The harbour has a width of about one cable and depths, in its central part, of from $3\frac{1}{2}$ to 7 fathoms (6^m4 to 12^m8). Small vessels entering the harbour usually anchor near the entrance and secure their stern to a buoy. The harbour is generally crowded with local craft. 5

Off-lying islands and dangers.—A shoal, with a depth of $4\frac{1}{2}$ fathoms (8^m2) over it, lies about 70 yards (64^m0) north-north-westward of the eastern entrance point of Kastelorizo harbour. 10

Eastward of the harbour are a number of islands and dangers, which form a sheltered roadstead, with depths of from 6 to 10 fathoms (11^m0 to 18^m3), sand and mud; the entrance is $1\frac{1}{4}$ cables wide between Polyphados island and Agrielaia island. There is also a channel, half a cable wide, close westward of Polyphados island, with a depth in it of 4 fathoms (7^m3). 15

St. George island lies close south-south-westward of Agrielaia island; foul ground, with rocks above and below water, extends between the two islands.

Psoradia island lies about 2 cables west-south-westward of Polyphados island; shoal water, with a least depth of one fathom (1^m8), extends between the two islands.

A shoal, with a depth of $5\frac{1}{2}$ fathoms (10^m8) over it, lies about $1\frac{1}{2}$ cables east-north-eastward of the northern extremity of Polyphados island.

In the southern part of the roadstead there is a rock, with a depth of 3 feet (0^m9) over it, situated $1\frac{1}{2}$ cables south-eastward of the eastern extremity of Psoradia island (*Lat.* $36^\circ 08' N.$, *Long.* $29^\circ 39' E.$); another rock, with a depth of less than 6 feet (1^m8) over it, lies close southward of it. 25

In the middle of the southern side of Polyphados island there is a wind direction indicator, on a staff, 20 feet (6^m1) high, for the use of aircraft; it is reported to be a good mark for identifying the island when approaching from the southward. 30

Koutsoumbora rock, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, lies about 2 cables eastward of the northern extremity of Agrielaia island. 35 A rock, with a depth of less than 6 feet (1^m8) over it, lies close south-south-eastward of Koutsoumbora rock.

Stronglyo, or Psomi, islet, with shoal water extending half a cable north-eastward and a quarter of a cable west-south-westward from it, lies three-quarters of a cable northward of Koutsoumbora rock. 40

Mavro-Poinaki rock and Mavro-Poinis rock, both surrounded by shoal water for a distance of about a quarter of a cable, are situated $1\frac{1}{4}$ cables south-south-westward and $2\frac{1}{2}$ cables southward, respectively, from Koutsoumbora rock.

Niphtis point, the eastern extremity of Kastelorizo island, is situated about $1\frac{1}{2}$ cables southward of Mavro-Poinis rock. 45

A shoal, with a depth of $6\frac{1}{2}$ fathoms (11^m4) over it, lies about one cable south-eastward of the southern extremity of Agrielaia island.

Prassoudi rock, above water, lies about 4 cables east-south-eastward of Koutsoumbora rock; a reef extends about a quarter of a cable south-south-westward, and a patch of rocks, with a depth of less than 6 feet (1^m8) over them, about one cable south-eastward of Prassoudi rock. 50

Two groups of islands and rocks, with charted depths of not less

Charts 2606, 2158b, 449.

Chart 236, plan of Kastelorizo roadstead and harbour.

than 12 fathoms (21^m9) in the fairway between them, lie about 2½ cables eastward, and 5 cables north-eastward, respectively, of Prassoudi rock.

Mooring buoys.—There are several mooring buoys in the harbour, 5 some of which are for the use of aircraft.

Light.—A light is exhibited, at an elevation of 33 feet (11^m0), from a turret on the eastern entrance point of Kastelorizo harbour (*Lat.* 36° 08' N., *Long.* 29° 39' E.).

Directions.—A vessel approaching from south-eastward should 10 pass westward of Prassoudi rock and the patch of rocks south-south-eastward of it, described above, thence northward of Stronglyo islet, Polyphados island, and Psoradia island, care being taken to avoid the 5½-fathom (10^m5) patch, about 1½ cables east-north-eastward of Polyphados island, and the 4½-fathom (8^m2) patch on the south- 15 eastern side of the harbour entrance.

Town.—Communications.—The town of Kastelorizo is situated on the shores of the harbour and is backed by steep hills. Fresh provisions may be obtained. A tug is available, except during the harvest, and there are several lighters.

20 There is regular steamer communication with Rhodes and a regular air-mail service.

Kastelorizo is connected to the general telegraph system.

Chart 236.

Current.—After a light scirocco following a maestrale, a current of 25 nearly 2 knots has been observed setting into the channel between Agrielaia and St. George islands and the Kastelorizo shore, and running out through the passage between Psoradia island and Polyphados island.

The current setting westward off the coast of Turkey (*see* pages 11, 30 12) divides at Ulu (Tugh) burun, situated about 6 miles south-eastward of Ada burnu (*Lat.* 36° 11' N., *Long.* 29° 44' E.), one part continuing westward and passing southward of Kastelorizo island, while the other sets through the gulf and out of Vathi channel, at a rate of from a half to 1½ knots. Sometimes the whole current sets westward, when part 35 of it appears to pass southward and westward of Kastelorizo island, eastward through Vathi channel, and then southward to the original current, which it joins.

Coast.—The coast from Ulu burun to the head of Asar Veya hisar (Assar) limanı, 5 miles east-north-eastward, appears to be steep-to, but 40 has only been partially examined.

Akar boğazı or Kar boğazı (Kara boghaz), the north-western extremity of which lies 3½ miles eastward of Ulu burun, is the channel between İç (Alimeteria) ada, or Akıntı adası, and the south-western extremity of a peninsula, known as Sicakyarım ada. Although narrow, it is 45 navigable, but a strong eddy current has been observed setting south-eastward through it.

Sicakyarım ada is connected to the mainland by an isthmus, on the western side of which is Asar Veya hisar limanı, mentioned above, and on the eastern side Polemos bükü.

50 Kekov (Kakava) adası, or Geyikli ova adası (ancient *Dolichiste*), 600 feet (182^m9) high, lies 4½ miles north-eastward of Sicakyarım ada. Three islets lie within 8 cables southward of the island, and Tragonesi adası lies about half a mile southward of the north-eastern extremity of Kekov adası. *See* view E on chart.

Charts 2606, 2158b, 449.

Chart 236, plan of S.W. entrance into Ölü deniz (Kakava roadstead).

Ölü deniz.—Between Sicakyarım ada and Kekov adası is the entrance to Ölü deniz (Kakava roads). Pilanda, or Karakol (Karaöl) adalari, a group of islets, divides the entrance into two channels, each about $1\frac{1}{4}$ cables wide, with depths of from 16 to 34 fathoms (29^m3 to 62^m2) in the fairway, but only a few soundings have been taken; the eastern one is to be preferred. 5

A rock, with a depth of 4 feet (1^m2) over it, and on which the sea often breaks, lies one cable north-north-eastward of the western extremity of Kekov adası (*Lat. $36^\circ 10' N.$, Long. $29^\circ 54' E.$*). 10

Chart 236, plan of Ölü deniz (Kakava roadstead).

Ölü deniz, between the middle of Kekov adası and the mainland, affords anchorage, in depths of from 4 to 23 fathoms (7^m3 to 42^m1). The most convenient berth for a large vessel is about 3 cables south-eastward of an old castle on a hill, 300 feet (91^m4) high, situated on the mainland, about $1\frac{3}{4}$ miles north-eastward of the south-western extremity of Kekov adası; the holding ground is generally good. 15

Rocks, some of which are above water, extend $1\frac{3}{4}$ cables offshore southward of the castle, and there is also a small patch of sunken rocks about half a cable off the south-western point of an islet on the eastern side of the anchorage, and 6 cables east-south-eastward of the castle. 20

The entrance to Ölü deniz from the eastward is straight and clear of dangers beyond half a cable from the shore on either side; there is generally a slight westerly current in it.

Uç ağız limanı (Tristomos harbour), the entrance to which is about half a mile westward of the castle, has depths of from 2 to 5 fathoms (3^m7 to 9^m1) and is landlocked. There are several islets and rocks in the entrance, and the northernmost islet divides it into two narrow channels, in which there appear to be depths of $3\frac{1}{2}$ and 4 fathoms (6^m4 and 7^m3), but neither have been closely examined. 30

Chart 236.

Coast.—Polemos bükü, on the northern side of the peninsula close westward of Kekov adası, affords anchorage to small vessels with local knowledge.

St. Stephanas limanı, a small bight on the south-eastern side of Kekov adası, with some islets off its entrance, also affords anchorage to small vessels with local knowledge. 35

Chart 236, plan of Yali bükü.

St. Elias island (*Lat. $36^\circ 12' N.$, Long. $29^\circ 57' E.$*), 166 feet (50^m6) high, lies about one mile north-westward of the eastern extremity of Kekov adası, and is separated from the mainland by a channel, 70 yards (64^m0) wide; an islet, 72 feet (21^m9) high, lies close off its northern extremity. 40

Martinis bank, above water, lies about one cable southward of St. Elias island. 45

Yesil (Ashil) ada, or Gök kaya, lies in the middle of Yali bükü, northward of St. Elias island. The channels on either side of it lead to the anchorage at the head of the bay. The northern side of this island attains an elevation of 279 feet (85^m0).

Yali bükü.—Yali bükü, contained within St. Elias island and Yesil ada, is surrounded by precipitous rugged mountains, covered with low bushes.

The bay affords anchorage for light-draught vessels, but the holding ground is not good and a vessel should moor for a long stay.

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Chart 236, plan of Yali bükü.

The channel northward of Yesil ada has a least width of about 80 yards (73^m2), with a least depth of 4½ fathoms (7^m8) in the fairway, and leads direct to the anchorage. It is better than the channel south-
 5 ward of Yesil ada which is narrower and intricate.

A vessel entering by the northern channel should keep on the southern side of the channel to avoid a patch of rocks, extending about half a cable southward from the northern shore abreast the middle of Yesil ada.

10 Chart 236.

Coast.—Çalpan (Andraki) burnu, about 2 miles east-north-eastward of the eastern extremity of Yesil ada, is the eastern entrance point of a bay, into the eastern side of which flows the Andraki nehri; this river is very brackish in the summer and has a bar, passable only by
 15 boats of light draught.

Kum burnu (Pyrgo point) (*Lat. 36° 12' N., Long. 30° 03' E.*), 2 miles eastward of Çalpan burnu, is the eastern extremity of a sandy and shallow bay; a ruined castle stands on the point. See view E on chart.

20 A steep gravel beach extends 5 miles east-north-eastward from Kum burnu, and there is a narrow entrance, between the eastern end of this beach and the coast of Finike (Phineka) promontory, into a large brackish lake. In the entrance to the lake, into the head of which a river flows, there is a depth of 3 feet (0^m9), and for some distance
 25 within depths of 1½ fathoms (2^m7).

Yunda, or Finike, burnu is the southern extremity of Finike promontory, which rises, about 5 miles north-north-westward to Beimelik dağ, 4,757 feet (1,450^m0) high; the mountains inland are snow-clad.

Gök liman.—Shoal.—Gök liman (Yeronda creek), on the eastern
 30 side of Finike promontory, has a depth of 7 fathoms (12^m8) at its head, but is open to southerly winds. The eastern side of the creek is a bold projection extending about one mile southward, and close south-eastward of its extremity is an islet named Güvercin adası, 84 feet (25^m6) high, with a channel between, available for small craft.

35 A shoal patch, with a depth of less than 6 fathoms (11^m0), which has not been closely examined, lies about half a mile south-westward of Güvercin adası.

Coast.—About 1½ miles northward of the above-mentioned projection, and on its eastern side, stands the old castle of Finike, near
 40 which two rivers flow into the sea. The silt from these two rivers has made a convenient bank for a summer anchorage south-eastward of the castle, in a depth of about 7 fathoms (12^m8). The depths at this anchorage were reported, in 1915, to be less than those shown on the chart.

45 Finike körfezi (Phineka bay) is contained between Finike promontory and Gelidonya (Kalidonya) burnu (*Lat. 36° 13' N., Long. 30° 28' E.*), 14 miles east-south-eastward. On the eastern side of the bay is an inlet, with depths in it of from 7 to 20 fathoms (12^m8 to 36^m6), known as Karaöz liman; near its northern entrance point are some white
 50 rocky cliffs resembling a castle, and between it and Finike castle the northern shore of the bay is low and sandy. Anchorage may be obtained, by vessels with local knowledge, in the southern part of the inlet, sheltered except from the westward.

The town of Finike (Phineka) is situated about half a mile northward

Charts 2606, 2158b, 449.

Chart 236.

of the castle, and there is a mole at which boats can land. Provisions may be obtained.

Gelidonya burnu (ancient *Sacrian prom*) is the southern extremity of a promontory which rises to an elevation of 3,510 feet (1,069^m8), about 4 miles north-north-eastward of the cape. It is steep-to. See views C and E on chart.

Beş adalar (Khelidonia), a group of islets, lie from half a mile to about $2\frac{1}{2}$ miles southward of Gelidonya burnu. The northernmost islet is 450 feet (137^m2) high, and between it and the cape there are considerable depths. The largest islet lies about 3 cables southward of the northern islet, and is 480 feet (146^m3) high. South islet lies 2 cables farther southward, and South-east islet one mile east-south-eastward of it. There are some creeks, available for small craft, in the largest islet.

The above islets are steep-to, except South-east islet (*Lat.* 36° 09' N., *Long.* 30° 29' E.), from which a reef extends about one cable eastward. The passages between the islets, and between them and Gelidonya burnu, are navigable.

Lights.—A light is exhibited, at an elevation of 61 feet (18^m6), from a position about half a mile south-south-eastward of the old castle at Finike.

A light is exhibited, at an elevation of 177 feet (53^m9) from a white stone structure, situated on Gelidonya burnu.

A light is exhibited, at an elevation of 744 feet (226^m8) from a white stone tower, with a dwelling attached, situated about 8 cables north-north-eastward of Gelidonya burnu.

Current.—The current off Gelidonya burnu generally sets westward at a rate of from one to 2 knots, but it appears to be very uncertain. It has been observed to set south-eastward at the rate of nearly 3 knots, and on the following day at the rate of about one knot, although there had been no change in the wind, weather, or swell, for several preceding days.

Chart 2606.

ANTALYA KÖRFEZİ.—Antalya körfezi (Gulf of Adalia) (ancient *Pamphylum mare*) lies between Gelidonya burnu and Anamur burun, 117 miles eastward.

Chart 236.

The coast between Gelidonya burnu (*Lat.* 36° 12' N., *Long.* 30° 27' E.) and the southern entrance point of Adrasan (Adratchan) limanı, 7 miles north-eastward, is mostly steep-to, but there are a few rocks lying close offshore.

Sulu (Grambusa) ada, or Karaboza adası (ancient *Crambúsa*), about $3\frac{3}{4}$ miles east-north-eastward of Gelidonya burnu, is 540 feet (164^m6) high, rugged and almost bare. There is a natural archway through the island, which can be used by boats, but a strong westerly current sets through it.

Anchorage may be obtained, in a depth of 26 fathoms (47^m5), between Sulu ada and the mainland; the bottom is mostly rocky.

Coast.—Adrasan limanı is open to the eastward, but affords a little shelter to small vessels, with local knowledge, in a cove inside the southern point of the bay.

Adrasan (Adratchan) burnu, close north-eastward of which is a

Charts 2606, 2158b, 449.

Chart 236.

barren islet, lies about $2\frac{1}{4}$ miles north-eastward of the northern point of Adrasan limanı. The channel between the cape and the islet has considerable depths, but the current is uncertain.

- 5 A peninsula of high white cliffs, with a cove on either side of the isthmus connecting it to the mainland, lies about 2 miles north-westward of Adrasan burnu (*Lat.* $36^{\circ} 20' N.$, *Long.* $30^{\circ} 35' E.$).

Mount Adrasan (Adratchan), about $3\frac{1}{4}$ miles north-westward of Adrasan burnu, is about 3,300 feet (1,005^m8) high. See views C and D
10 on chart.

Light.—A light is exhibited, at an elevation of 148 feet (45^m1), from a white iron column, with a dwelling attached, situated on the southern entrance point of Adrasan limanı.

Chart 326, plan of Cineviz limanı (Port Genovese).

- 15 Cineviz limanı (Port Genovese), on the northern side of the isthmus mentioned above, affords anchorage in a depth of about 9 fathoms (16^m5), with good holding ground. There are three above-water rocks in the middle of the entrance which are steep-to, and at the head of the bay there is a beach. Northerly winds send in some swell, and heavy
20 westerly squalls blow down Mount Adrasan. See view on chart below the plan.

Chart 236.

- Çıralı limanı (Chiralu) is contained between a point about $1\frac{1}{2}$ miles north-north-westward of the head of Cineviz limanı, and a point
25 $1\frac{3}{4}$ miles farther northward. On the south-western shore of the bay is Deliktash village where are the ruins of the ancient city of *Olympus*. On the side of a wooded hill, near the northern end of the bay, and about $1\frac{1}{4}$ miles inland, is Yanar volcano, which emits a bright and constant flame that may be seen from some distance.

- 30 Between the northern entrance point (*Lat.* $36^{\circ} 25' N.$, *Long.* $30^{\circ} 34' E.$) of Çıralı limanı and a point 4 miles north-north-eastward, the coast is indented by a succession of small bays, and consists of black crumbling rock. From every point a reef projects from one to 2 cables.

- The coast from the northernmost small bay to a point $2\frac{1}{4}$ miles
35 north-north-eastward consists of a sandy beach. Tekirova (Tekróva) peninsula lies three-quarters of a mile farther north-eastward. The small bay immediately northward of Çıralı limanı is encumbered with rocks.

- Off-lying islets.**—Üç adalar (Triánesia), a group of three low
40 islets, lies 7 miles north-north-eastward of Adrasan burnu, and $1\frac{1}{4}$ miles offshore. Anchorage may be obtained around the islets, in depths of from 18 to 30 fathoms (32^m9 to 54^m9). In the eastern islet there is a cove, into which small craft can warp. A reef extends about $1\frac{1}{2}$ cables north-north-eastward from the eastern islet, and a small patch of
45 rocks lies about the same distance eastward of the cove.

Chart 236, plan of Tekirova (Tekróva).

Tekirova.—Tekirova (ancient *Phaselis*) is a town in ruins on a small peninsula, which has on either side the remains of an artificial port.

Chart 236.

- 50 **Coast.**—From Tekirova the land rises gradually to Tahtalı dağ (Mount Tákhtalu) (ancient *Solyma*), 7,792 feet (2,375^m0) high, about $5\frac{1}{2}$ miles westward. See view C on chart.

The coast between Tekirova (*Lat.* $36^{\circ} 31' N.$, *Long.* $30^{\circ} 37' E.$) and Agva burnu (Cape Avova) or Beyaz burun, about 5 miles north-north-

Charts 2606, 2158b, 449.

Chart 236.

eastward, is a gravel beach, through which two rivers flow into the sea. About 3 miles north-north-eastward of Tekirova there are two remarkable rocks, about 300 feet (91^m4) high.

Agva burnu is a bold cliff of white rock, rising to a hill, 990 feet (301^m7) high. At its southern extremity is a creek in which small craft shelter, and in the middle of the cape there is a deep cave, which could be entered by several boats. A rivulet flows into a small bay on the northern side of the cape. Foul ground extends about 3 cables eastward and northward of the cape. 10

A patch of rocks, nearly awash, on which the sea usually breaks, lies about 1½ miles north-north-westward of Agva burnu. Adrasan burnu, bearing about 193°, just open eastward of Agva burnu, leads about one mile eastward of these rocks.

The coast from Agva burnu to abreast Reşat (Rashat) adası, 12 miles northward, has a high range of mountains running parallel to it, from 3 to 4 miles inland, spurs of which descend to the sea. There are some suspicious overfalls about 4½ miles southward of Reşat adası, where shoal water may exist.

Reşat adası (ancient *Atelebusa*), 360 feet (109^m7) high, is separated from the mainland by a narrow channel, which is much reduced in width by a shoal extending from the coast.

The coast from one mile north-north-eastward of Reşat adası to Antalya, for a distance of 5½ miles north-eastward, is bordered by a steep gravel beach. 25

Chart 236, plan of Antalya (Adalia).

Antalya.—Antalya (ancient *Olbia*) (*Lat.* 36° 52' N., *Long.* 30° 46' E.) is situated at the head of Antalya körfezi, 7½ miles north-eastward of Reşat adası, and is the largest town in the gulf. The population, in 1945, was 25,037. 30

The town is built round the harbour on cliffs, 100 feet (30^m5) high, and is surrounded by an ancient ditch and a rampart with numerous towers. The country in the vicinity is fertile, extensively cultivated, and well watered. The port is open for International trade and provides an outlet for grain and agricultural produce. 35

The small harbour is encumbered with rocks which render it unsuitable for general use. A concrete breakwater extends for about three-quarters of a cable north-westward from the rocky point at the south-eastern extremity of the harbour, and another short concrete breakwater, about 100 feet (30^m5) long, extends south-eastward from the north-western corner of the harbour. The entrance between the heads of these two breakwaters is about 100 feet (30^m5) wide. There is a quay, 430 feet (131^m1) long, with a depth alongside of 4 feet (1^m2).

Light.—A light is exhibited, at an elevation of 25 feet (7^m6), from an iron column, about 15 feet (4^m6) in height, on the head of Antalya south-eastern breakwater. 45

Two lights mark the entrance to Antalya harbour.

Sea level.—Tides are negligible, but south and south-west winds may raise the sea level, by 2 feet (0^m6), and north and north-east winds lower it by a similar amount. 50

Port facilities.—There are some privately owned motor craft, capable of towing lighters and several lighters with capacities of from 9½ to 13 tons.

Fresh provisions are available.

Charts 2606, 2158b, 449.

Chart 236, plan of Antalya (Adalia).

Water is plentiful, but very hard, and is laid on to the quay. A new municipal water installation was under construction, in 1949.

Communications.—There is regular steamer communication with 5 other Turkish ports, and with other Turkish towns by regular air service.

Antalya is connected to the general telegraph system.

Trade.—The principal imports are manufactured goods, rice, coffee, sugar, petroleum, metals, wines and spirits. The chief exports are 10 wheat, timber, firewood, charcoal, cereals of all kinds, goatskins, beeswax, flour in bags and oilcake.

Deratisation.—See page 15.

Chart 236.

Anchorage.—Good anchorage may be obtained in summer off 15 Antalya, in depths of from 15 to 20 fathoms (27^m4 to 36^m6), within 3 cables of the shore, but the anchorage is unsafe in the winter. An obstruction, marked by a conical buoy, lies in the northern end of the anchorage, about $1\frac{1}{2}$ cables westward of the harbour entrance.

It is reported that if a low greyish cloud appears at the head of the 20 bay, westward of Agva burnu, it is an unmistakable indication of a scirocco.

Coast.—**Light.**—About three-quarters of a mile south-eastward of Antalya, several streams fall from the cliffs into the sea.

Chart 236, plan of Laara.

25 Baba burnu, about $3\frac{1}{2}$ miles south-eastward of Antalya, is remarkable for its overhanging cliffs. The remains of the artificial harbour of Laara (ancient *Attalia*) (*Lat.* $36^\circ 50' N.$, *Long.* $30^\circ 52' E.$) are situated $1\frac{1}{2}$ miles eastward of Baba burnu, but there are few vestiges of the town to which it belonged. See plan on chart 236.

30 A light is exhibited, at an elevation of 114 feet (34^m7), from a white stone tower, with dwelling attached, situated on Baba burnu.

The coast between Laara and Eski Antalya or Selimiye, about 29 miles eastward, is low and sandy, and several rivers enter the sea. Of these Ak su (ancient *Cestrus*) and Köprü (Keupri) ırmagı (ancient 35 *Eurymedon*), about 4 and 17 miles eastward, respectively, of Laara, are large; inside their bars they are deep, but small boats can only enter with difficulty.

Sandhills, generally low, in some places bare and in others covered with bushes, stretch along the beach; a group of high sandhills stands 40 about midway between Laara and Eski Antalya. From the sandhills a broad irregular plain extends to the foot of the mountains.

A rocky reef extends about $1\frac{1}{2}$ miles offshore, 4 miles eastward of the mouth of the Köprü ırmagı; there may be other rocks outside the reef. A river flows into the sea near the eastern part of the reef, and hills 45 approach its mouth.

Chart 236, plan of Eski Antalya (Eski-Adalia).

Eski Antalya (ancient *Sidè*) is situated on a point projecting about half a mile west-south-westward from the coastline.

The harbours are now filled up, but numerous ruins, particularly 50 an enormous theatre, are in good preservation. A small village is situated amongst the ruins.

Chart 236.

Caution.—The low sandy coast between Laara and Eski Antalya must be approached with caution, as it has not been closely examined.

Charts 2606, 2158b, 449.

Chart 236.

Coast.—The coast between Eski Antalya and Kara burnu, 16 miles east-south-eastward, is low and sandy ; several rapid rivers enter the sea through this stretch of coast. Rocks and shoal water extend about half a mile offshore, in places.

Manavgat ırmagı (ancient *Melas*) enters the sea about $5\frac{1}{2}$ miles east-south-eastward of Eski Antalya (*Lat.* $36^{\circ} 52' N.$, *Long.* $30^{\circ} 46' E.$), with a depth of 3 feet (0^m9) on the bar. Close within the entrance it is about one cable wide, with a depth of 12 feet (3^m7), which increases to 21 feet (6^m4) farther up river. On the right bank, about 3 miles within the entrance, is a castle, known as Manavgat kalesi, and here the river is about a quarter of a cable wide, with a depth of 13 feet (4^m0). The muddy water from the river extends several miles seaward. The mouth of the river is not visible from seaward as, within the entrance, it runs parallel with the coast.

There is a large and noticeable gap in the mountains, through which the river flows.

Charts 236, 237.

Kara burnu is a cliff covered with dark trees. An islet lies close off a point about half a mile westward of the cape, and there are several rocks in its vicinity. See view on chart 237.

Chart 237.

Between Kara burnu and Dildade (Kiloarda) burnu, $16\frac{1}{2}$ miles east-south-eastward, the coast is bordered by rocks and islets, in places ; these extend about one mile offshore about 7 miles from Kara burnu, and the coast should therefore be approached with caution.

Chart 237, plan of Ptolemais.

About 5 miles east-south-eastward of Kara burnu, a point, named Figla burun, projects about half a mile south-westward from the coast-line, and is the supposed site of the ancient *Ptolemais*, but the long pier which formed its harbour is now sunken. Off the point there are patches of rocks, and the soundings are irregular.

Chart 237, plan of Alanya (Alaya).

Dildade burnu (*Lat.* $36^{\circ} 32' N.$, *Long.* $32^{\circ} 02' E.$) is the south-western extremity of a promontory which extends about one mile southward from the coastline. The promontory, which is 780 feet (237^m7) high, has dark reddish cliffs on its western and southern sides, 600 feet and 500 feet (182^m9 and 152^m4) high, respectively. A high ridge of rocks extends about 3 cables south-westward from the cape. The bay formed on the eastern side of the promontory is known as Alanya limanı.

Light.—A light is exhibited, at an elevation of 686 feet (209^m1), from a low white tower, with dwelling attached, on the cliffs on the southern side of the above-mentioned promontory.

Anchorage.—A moderately good anchorage may be obtained, in a depth of 6 fathoms (11^m0), in Alanya limanı, with the Octagon tower, situated about 5 cables north-north-eastward of the above lighthouse, bearing 270° , distant 3 cables. Small vessels go close in to the landing place, which is a rough stony beach close southward of the Octagon tower.

This anchorage must be used with caution, especially in winter, as the bottom is loose sand and a heavy surf rolls in during and after southerly winds.

Alanya.—The town of Alanya (ancient *Coracesium*) stands on the

Chart 237, plan of Alanya (Alaya).

eastern side of the promontory, the houses being built in terraces, one above another, on the steep rocky slope. See view of plan on chart 257. The town is connected to the general telegraph system.

5 *Chart 237.*

The coast between Alanya (*Lat. 36° 32' N., Long. 32° 03' E.*) and Gazipaşa (Silinti), about 21 miles south-eastward, is mostly high and bold, with only a few indentations and no harbours. Tekne dağı (Mount Alaya), 5,544 feet (1,689^m8) high, 8 miles eastward of Alanya and 4 miles inland, is a good landmark. See view on chart 237.

10 *Chart 237, plan of Hamaxia.*

The ruins of the ancient town of *Hamaxia* are on a promontory which extends about one cable southward from the coast, 17 miles south-eastward of Alanya. The cliffs of the promontory are 138 feet (42^m1) high.

The bay formed between Gazipaşa and a point about 1½ miles north-north-westward is known as Halil limanı.

Chart 237, plan of Gazipaşa (Silinti).

Gazipaşa (ancient *Trajanopolis*), the ruins of which are near the mouth of a shallow river, named Injakara or Kara su, 4 miles south-eastward of *Hamaxia*, contains the mausoleum of the Emperor Trajan, a very large structure, surrounded by one hundred and ten columns.

The cliffs southward of the river mouth are 585 feet (178^m3) high.

Chart 237.

25 *Antiochia* (probably the ancient *Antiochia of Cragus*) lies about 8½ miles south-eastward of Gazipaşa and has extensive ruins. About 5½ miles south-eastward is *Nephilis* (probably the ancient *Nephilis prom*), and 4 miles farther east-south-eastward is Karga burnu.

30 *Kalediran koyou* is a bay contained between Karga burnu and a point about 1½ miles westward. At the head of the bay is the town of *Kalediran* (Kardran) (ancient *Charadus*).

Melleç (Melisse) is a small bight about 5½ miles south-eastward of Karga burnu. A pier extends from its shore, and there are several red buoys moored off it.

Chart 237, plan of Anamur burnu (Cape Anamur).

Anamur burnu (*Lat. 36° 01' N., Long. 32° 51' E.*) (ancient *Anemurium*) lies 5½ miles east-south-eastward of the western extremity of *Melleç*. Its western bluff is 500 feet (152^m4) high, bold, and steep-to, and vestiges of the old city cover the cape and vicinity. See view on chart 237.

Good anchorage may be obtained, by vessels with local knowledge, on the eastern side of the cape during the fresh westerly sea breeze.

45 **Light.**—A light is exhibited, at an elevation of 223 feet (68^m0), from a white stone tower, 33 feet (10^m1) in height, on Anamur burnu.

Chart 237.

COAST.—The coast from Anamur burnu trends north-eastward for 6 miles to a point on which stands a village and the large old castle of Anamur, and is bordered by a sandy beach. (See view on chart 237.) A river, known as *Tatlisu nehir* (Direk Ondessi chai) enters the sea half a mile westward of the castle.

The coast eastward of the castle becomes higher, and between a point about 4 miles east-north-eastward of the castle and *Kızıl burun*

Chart 237.

(Kızılman), about $5\frac{1}{4}$ miles east-south-eastward, there are several small bays, which might afford shelter to vessels with local knowledge.

An island, known as Adacık ada, lies close offshore about 4 miles east-north-eastward of the castle. Toros Dağlar (Taurus mountains) 5 (chart 2158b) back this coast and are visible from a great distance.

Safta kalessi stands on a hill, 660 feet (201^m2) high, about $2\frac{1}{4}$ miles north-eastward of Adacık ada, and, on the coast below this castle, are the ruins of an ancient pier and town (probably *Arsinoe*).

Kızıl burun is the extremity of a peninsula projecting about one 10 mile southward, 500 feet (152^m4) high, and bold. (See view on chart 237.)

The coast between Kızıl burun (*Lat.* $36^\circ 04' N.$, *Long.* $33^\circ 06' E.$) and Soğuk su limanı (Port Melania), 11 miles east-north-eastward, appears to be high and mostly steep-to, but rocks and shoal water 15 extend about half a mile offshore, for a distance of about $4\frac{1}{2}$ miles eastward, from a position 4 miles north-eastward of Kızıl burun.

A bare rock, 50 feet (15^m2) high, lies about $4\frac{1}{2}$ miles north-eastward of Kızıl burun, and $1\frac{1}{4}$ miles offshore.

Chart 237, plan of Soğuk su limanı (Port Melania). 20

Soğuk su limanı, open to southerly and south-easterly winds, is deserted, but small vessels with local knowledge can obtain shelter in it. *Chart 237.*

The coast between Soğuk su limanı and Gilindire limanı (Port Kilindire), about 2 miles east-north-eastward, appears to be high and 25 fairly steep-to.

Chart 237, plan of Gilindire limanı (Port Kilindire).

Gilindire limanı (ancient *Celendris*) is a small but secure harbour, with depths of from one to $2\frac{1}{2}$ fathoms (1^m8 to 4^m6). It was reported, in 1934, that the inlet had silted considerably, and that there was a 30 small jetty. There is a ruined fortress and a large tower on the point on the eastern side of the inlet, a few huts on the shore near the head, and the village of Gilindire close eastward.

Light.—A light is exhibited, at an elevation of 75 feet (22^m9), from an iron framework structure on a masonry base, on the point on the 35 eastern side of Gilindire limanı.

Coast.—Between Gilindire limanı and Sancak burnu, $5\frac{1}{4}$ miles eastward, the coast is indented. Two islets, one of which is 114 feet (34^m7) high, lie about one mile south-eastward of Gilindire limanı, and a bare rock, 96 feet (29^m3) high, lies about $1\frac{1}{4}$ miles south-westward 40 of Sancak burnu (*Lat.* $36^\circ 07' N.$, *Long.* $33^\circ 26' E.$).

Between Sancak burnu and Ovacık, about 13 miles eastward, the coast is divided into two bays by a promontory, known as Ada burnu, the south-eastern point of which is probably the ancient *Aphrodisias*. The western bay is known as Babadul limanı, and the eastern bay as 45 Ovacık körfezi; in each of the bays there are several creeks and inlets which could be entered by vessels of moderate size, with local knowledge, but none of them afford shelter from south-westerly winds.

Ovacık, a small village, lies at the head of Ovacık körfezi, near the ruins of *Holmus*, where there is a small pier. 50

Anchorage may be obtained about three-quarters of a mile offshore, in a depth of 11 fathoms (20^m1), with Ada burnu bearing 231° , and the south-western extremity of Ovacık burnu bearing 148° ; grain is loaded here from lighters.

Charts 2606, 2158b, 449.

Chart 237, plan of Babadul adaları (Papadula islands).

Babadul (Papadula) adaları (ancient *Crambusa*) lie half a mile south-westward of Ada burun, and consist of two islands separated from each other by a narrow, rocky channel; the southern, and larger, island is 5 342 feet (104^m2) high.

Chart 237.

Ovacık burnu (Cape Cavalière) (ancient *Sarpedon prom*) is the southern extremity of a promontory, 738 feet (224^m9) high, which is connected to the mainland by a low, narrow, isthmus. A small bay is 10 formed on either side of the isthmus, that on the western side being foul.

Chart 237, plan of Ovacık adası (Cavalière island) and port.

The bay on the eastern side of the isthmus, mentioned above, affords good anchorage, divided into two parts by Ovacık adası (Cavalière island) (*Lat. 36° 10' N., Long. 33° 43' E.*). A good berth is in the 15 northern part, with the north-eastern part of the island bearing 162°, distant 2 cables, in a depth of about 18 fathoms (32^m9).

Chart 237.

Between Ovacık adası and Aghaliman burun, about 10 miles north-north-eastward, and from thence to the head of Taşucu körfezi, about 20 3 miles farther north-north-eastward, the coast is high and steep. From this point the coast trends south-south-eastward for about 6½ miles to Bagase (Bagasse), or Ince Kum burnu, the eastern entrance point of Taşucu körfezi, and consists of low sandhills. From a position about 1½ miles south-eastward of the head of Taşucu körfezi to Bagase 25 burnu the coast is fringed by numerous overfalls and shifting shoals, which should not be approached.

Chart 237, plan of Kargincık or Dana adası (Provençal or Maravat island).

Kargincık (Provençal) (ancient *Pityussa*), or Dana adası, a large 30 island lying about 1½ miles offshore, 3½ miles east-north-eastward of Ovacık adası, is 900 feet (274^m3) high, near its south-western extremity. There are numerous ruins on the north-western side of the island.

Kargincık boğazi, the channel between the island and the mainland, affords good anchorage with shelter in all weathers. A good berth is 35 in a depth of 17 fathoms (31^m1), mud, with the extremities of the island bearing 183° and 080°, respectively; nearer the island there are some patches of rough ground.

A rock, awash, and steep-to at a distance of less than one cable, lies 40 half a mile west-south-westward of the south-western extremity of the island.

Light.—A light is exhibited, at an elevation of 229 feet (69^m8), from a white iron pedestal on a concrete base, situated on the north-eastern extremity of Kargincık adası (*Lat. 36° 12' N., Long. 33° 48' E.*).

Chart 237, plan of Agha liman.

45 **Coast.**—On the north-western shore of Taşucu körfezi there are several small bays; of these Agha liman, on the north-western side of Aghaliman burun, is a good harbour for small vessels. Some shelter could be obtained by large vessels in the bays on either side of the peninsula of which Aghaliman burnu is the north-eastern extremity.

50 A small fort, in ruins, stands on the western shore of Agha liman and forms a prominent landmark; the village within its walls was reported, in 1934, to be deserted.

Chart 237.

Taşucu village, where there is a mosque, is situated near the head of

Charts 2606, 2158b, 449.

Chart 237.

Taşucu körfezi, about $3\frac{1}{2}$ miles north-eastward of Agha liman, and is the landing place for Silifke, also known as İçıl, about 5 miles inland.

There is a jetty, about 100 feet (30^m5) long, at the inner end of which there is a large white square building, and some sheds. A considerable amount of barley is shipped from here, and is transported in sailing lighters to vessels anchored off the jetty in a depth of about $5\frac{1}{2}$ fathoms (10^m1). 5

The village has a post office and harbour office, and is connected to the general telegraph and telephone systems. 10

Provisions can be obtained from Silifke.

Bagase, or Ince Kum burnu, is the extremity of a long projecting point of low sand, off which an irregular shoal spit extends about one mile southward; three-quarters of a mile farther southward is a sand patch, with a depth over it of $4\frac{1}{2}$ fathoms (8^m2). 15

Light.—Taşucu light (*Lat. $36^{\circ} 14' N.$, Long. $33^{\circ} 59' E.$*) is exhibited, at an elevation of 33 feet (10^m1), from a white iron tower, with dwelling attached, situated on Bagase burnu.

Caution.—The coast in the vicinity of Bagase burnu has not been examined since the survey of 1812, and it is probable that the spit, together with the adjacent shoals, may be extending. It was reported, in 1929, that the coast here is shown on the chart 2 miles too far northward; also that at a distance of $6\frac{1}{2}$ miles from the spit there are depths of over 100 fathoms (182^m9), although the water may be discoloured. Great caution must, therefore, be exercised when in this locality. 25

Coast.—Between Bagase burnu and the mouth of the Göksu nehir (Ghiuk suyu), about $9\frac{1}{2}$ miles north-eastward, the coast consists of low sandhills, covered with shrubs, and shoal water appears to extend about half a mile offshore. 30

Göksu nehir (ancient *Calycadnus Fl.*) flows out with a strong current, which sets eastward for about 2 miles and then turns sharply south-westward; in this latter direction its muddy course is marked by a well-defined line. The entrance to the river is 200 feet (61^m0) wide, and inside the bar there is a depth of 3 fathoms (5^m5). It was formerly navigable to what is now Silifke, but at present its mouth is closed by a shallow bar. The entrance points are steep-to, and there are no off-lying dangers. 35

Anchorage may be obtained, in a depth of 15 fathoms (27^m4), about half a mile southward of the mouth of the Göksu nehir. 40

Between the entrance to Göksu nehir and Perşembe (Pershendî), about 5 miles northward, the coast is bordered by low sandhills, thence to Lamas, about 11 miles north-eastward, it is indented by numerous creeks and inlets, but there are no harbours or sheltered anchorages, except at Perşembe; the numerous ruins and towers, however, attest the ancient population and importance of this stretch of coast. 45

Perşembe, where the ruins are extensive, stands at the head of a bay which forms a small harbour, with rocks on its eastern side and a sandy beach on its western side. A quay extends about 394 feet (120^m1) south-eastward, and then northward for about 260 feet (79^m2), from the head of the bay; in 1942, there was reported to be a depth of 6 feet (1^m8) alongside at high water. 50

Good anchorage has been reported about one cable off the quay, and for larger vessels about one cable farther seaward.

Charts 2606, 2158b, 449.

Chart 237, plan of Korghos-Kalaler.

Two castles, known as Kiz and Körgöz kalesi (Korghos-Kalaler) (ancient *Corycus*), stand about 3 miles north-eastward of Perşembe (*Lat.* $36^{\circ} 25' N.$, *Long.* $34^{\circ} 07' E.$). The northern and larger is on the 5 mainland and is in ruins, the other nearly covers an islet on which it is built, and both are prominent landmarks. See plans of the castles on chart 237.

Chart 237, plan of Ayash.

Ayash, the site of the ancient island and important city of *Eleusa*, 10 situated $1\frac{1}{2}$ miles north-eastward of the northern castle, described above, is now a mere collection of huts. The coast in the vicinity presents a succession of ruins, amongst which the aqueduct, 6 miles long, extending from the old city of Eleusa to the Lamas çayı, is remarkable.

Chart 237.

The entrance to the Lamas çayı, which lies close north-eastward of the village of the same name, is not visible until close offshore, as its outer reach runs parallel to the coast, and it enters the sea through a narrow opening hidden by sand dunes.

20 North-eastward of the mouth of the Lamas çayı the coast rises gradually to a range of mountains from 5 to 8 miles inland and several rivers flow out. There are two landing stages on this coast, one at the mouth of the Alata çayı, situated about 4 miles north-eastward of the mouth of the Lamas çayı, and the other south-eastward of the 25 village of Eıvanlı or Temuk, situated about $1\frac{1}{2}$ miles inland, 5 miles farther north-eastward.

Chart 2668.

Mezetlu (ancient *Soli*), 17 miles north-eastward of Lamas, is situated on a small projection of the coast. Numerous vestiges of the ancient 30 city still remain, including the masonry piers of the ancient port, which is now filled with sand.

Mersin roadstead.—Lights.—The port of Mersin is an open roadstead south-eastward of the town, which is situated about $5\frac{1}{2}$ miles north-eastward of Mezetlu. In its hinterland there is much cotton 35 production and there are also important mining resources.

Mersin light (*Lat.* $36^{\circ} 47' N.$, *Long.* $34^{\circ} 37' E.$) is exhibited, at an elevation of 53 feet (16^m2), from a white stone tower, with dwelling attached, situated on a point near the south-western end of the town.

A light is occasionally exhibited from the outer end of the Custom 40 house pier, abreast the centre of the town.

Shoals.—A coral patch, with a depth of $4\frac{1}{2}$ fathoms (7^m8) over it, lies about one mile eastward of Mersin lighthouse; a similar patch, with a least depth of $5\frac{1}{2}$ fathoms over it, lies about 11 cables east-south-eastward of Mersin lighthouse.

45 **Anchorage.—Buoy.**—The best anchorage is about one mile offshore, in a depth of 6 fathoms (11^m0), stiff mud, with Mersin lighthouse bearing about 270° , distant $1\frac{1}{2}$ miles. An anchorage is also indicated on the chart, in a depth of 5 fathoms (9^m1), with Mersin lighthouse bearing 251° , distant about $1\frac{1}{2}$ miles.

50 These anchorages are open to winds between south-west and east-south-east, but the holding ground is good. The sea is unpleasant for boats during onshore winds, and also during the south-westerly sea breeze in summer.

A conical buoy is moored about 9 cables north-eastward of Mersin 55 lighthouse.

Charts 2606, 2158b, 449.

Chart 2668.

Sea level.—Southerly and westerly winds may raise the sea level by as much as 2 feet (0^m6) while northerly and easterly winds may lower it by a similar amount.

Prohibited anchorage.—Anchorage is prohibited in an area, indicated by pecked lines on the chart, extending about 3½ miles southward from Mersin lighthouse (*Lat. 36° 47' N., Long. 34° 37' E.*). 5

Mersin.—When approaching Mersin the following objects are prominent and easily identified:—The southern of two minarets, which stands near the shore, about 9 cables north-north-eastward of Mersin lighthouse, and a factory with two chimneys, situated about 11 cables north-eastward of this minaret. 10

Mersin is an open port and a regular port of call for vessels employed in the coasting trade of Asia Minor and Syria. The country in the vicinity is well cultivated. 15

Mosquitoes are very troublesome in the summer, during which season there is much malarial fever. It was, however, reported, in 1946, that considerable importance had become attached to malarial control.

Piers.—There are five main piers:—The south-western pier, about 9 cables north-eastward of Mersin lighthouse, which was still under construction in 1949, is 370 feet (112^m8) long, and has a width of 28 feet (8^m5). In 1949, there was a depth of 6 feet (1^m8) alongside at its head, and for a distance of 180 feet (54^m9) therefrom. There will be landing steps on either side of this pier. 20

The Custom house pier, which is the principal landing place, lies about one cable north-north-eastward of the above-mentioned pier. It is 330 feet (100^m6) long, with a width of 20 feet (6^m1), and has a small crane on it. In 1949, there was a depth of 6 feet (1^m8) at its head and at the landing steps on its north-eastern side, whence it shoals to the shore. 25

Both the above piers are, at times, unusable owing to the surf. 30

Close north-eastward of the Custom house pier (*Lat. 36° 47' N., Long. 34° 38' E.*) is another pier, 370 feet (112^m8) long, with a width of 18 feet (5^m5). In 1949, there was a depth of 8 feet (2^m4) alongside at its head shoaling to 6 feet (1^m8) at a distance of 100 feet (30^m5) therefrom. There is a small crane on this pier. 35

About 2½ cables north-eastward of the Custom house pier is a concrete pier, 410 feet (125^m0) long, with a width of 52 feet (15^m8). It has two travelling cranes and is connected to the railway system. In 1949, there was a depth of 10 feet (3^m0) alongside at its head, shoaling to 6 feet (1^m8) at a distance of 180 feet (54^m9) therefrom. Water is laid on to this pier, at which there is considerable lighter traffic. 40

The north-eastern pier, a concrete structure, 400 feet (121^m9) long, with a width of 37 feet (11^m3), extends from the shore about 5½ cables north-eastward of the Custom house pier. It has a travelling crane and is connected to the railway system. In 1949, there was a depth alongside of 8 feet (2^m4) at its head, shoaling to 5½ feet (1^m7) at a distance of 90 feet (27^m4) therefrom. 45

Port facilities.—Tugs and several lighters are available. 50

Small repairs to machinery can be carried out in the railway workshops.

Water is laid on to some of the main piers and there are also two water-boats with a capacity of 25 tons each.

Charts 237, 2606, 2158b, 449.

Chart 2668.

Fresh meat, eggs, and vegetables are plentiful.

Communications.—Mersin is connected to the railway system of Asia Minor and Syria and also to the general telegraph system.

- 5 **Trade.**—The principal imports are coal, agricultural machinery, and automobiles. The chief exports are wheat, barley, cotton, cotton seed oil, and cake, sesame seed, yellow berries for dyes, vegetable gum, sheep, goats, cattle, and copper chrome ore. The last-named is the most important.

- 10 **Deratisation.**—*See* page 15.

Coast.—The coast between Mersin and a point on which stands the village of Karaduvar (Karadavar) Kariasi, about 3 miles eastward, consists of low sandhills.

Chart 237.

- 15 About one mile northward of Karaduvar (*Lat.* 36° 48' N., *Long.* 34° 41' E.) there is a large tree which provides a prominent landmark when approaching the anchorage at Mersin.

- The coast between Karaduvar and Kazanlı Koyu (Kazanlı), about 2 miles eastward, is low, and thence to the mouth of the Tarsus çayı (irmağı), 5½ miles south-eastward, consists of sandhills.

A hill, 1,200 feet (365^m8) high, which appears as an island from the south-westward, stands about 7 miles north-north-eastward of Kazanlı Koyu.

- Caution.**—The coastline, as charted, from Mersin to Karataş (Karadash) burnu, 38 miles east-south-eastward, has been reported to be incorrectly charted, and Deli burnu, situated about 10 miles east-south-eastward of Mersin lighthouse, in particular, is reported to have extended a considerable distance into the bay. The chart, therefore, must be used with caution, owing to the imperfect nature
- 30 of the survey.

Coast.—Tarsus çayı (ancient Cydnus) flows through the town of Tarsus, about 11 miles north-north-eastward of its mouth. It is a quarter of a cable wide at its entrance where there is a depth of 12 feet (3^m7).

- 35 Seyhan nehir (ancient *Sarus*) enters the sea at Deli burnu, about 2 miles southward of the mouth of the Tarsus çayı, and is nearly half a cable wide at its entrance where there is a depth of 12 feet (3^m7).

- A spit extends about one mile from the sand head which separates
- 40 the two rivers, and should not be approached into a depth of less than 12 fathoms (21^m9).

- Along the beach, between Mersin and the mouths of these rivers, numbers of fine turtle are found; in June they go in pairs on the surface of the water and can be harpooned easily. The sea also
- 45 appears to be well stocked with fish.

- The coast from the mouth of the Seyhan nehir (*Lat.* 36° 42' N., *Long.* 34° 53' E.) to Karataş burnu, about 23 miles south-eastward, consists of a beach rising to high sandhills, with a sandy plain extending some miles inland. The plain is largely mere desert, some parts of
- 50 which are inundated with water, and others are sandhills with a few scattered bushes.

About half a mile northward of Karataş burnu the coast becomes cliffy. A 5-fathom (9^m1) shoal lies about 3¼ miles west-north-westward of the cape.

Charts 2632, 2606, 2158b, 449.

Chart 2791, plan of Karataş (Karadash) road.

Akyatan, a large salt lake, communicates with the sea about $1\frac{1}{4}$ miles north-westward of Karataş burnu. It is about 12 miles long north-east and south-west, has a depth in it of about 3 feet (0^m9), and is surrounded by barren sands; its shores are covered with swans, 5 pelicans, storks, etc., and it contains turtle and fish.

Karataş burnu is a low white cliff, within which are the ruins of the ancient town and citadel of Megarsus, which are prominent. See view on chart 2791. A spit, with a depth of less than 3 fathoms (5^m5) over it, extends about $1\frac{1}{4}$ cables south-south-westward of the cape. A 10 shoal, with a least depth of $4\frac{1}{4}$ fathoms (7^m8) over it, lies one mile west-south-westward of the cape.

Light.—A light (*Lat.* $36^{\circ} 33' N.$, *Long.* $35^{\circ} 21' E.$) is exhibited, at an elevation of 115 feet (35^m0), from a white iron mast, with a dwelling, 15 situated on Karataş burnu.

Chart 2632.

ISKENDERON KÖRFEZİ. — General remarks. — Iskenderon körfezi (ancient *Sinus Issicus*) at the northern end of the coast of Syria, is entered between Karataş burnu (*Lat.* $36^{\circ} 32' N.$, *Long.* $35^{\circ} 20' E.$) and Resülhınzır (Ras el Khanzir), 25 miles south-eastward. 20 The bottom of the gulf is chiefly mud.

The shores vary considerably, but consist for the greater part of plains situated at the bases of mountains. Several mountain torrents and small streams flow into the gulf, the principal one being the Ceyhan nehir (Jaihûn chai), which enters the sea at the southern 25 entrance point of Yurmurtalık limanı (Ayas bay), about 21 miles north-eastward of Karataş burnu.

Iskenderon limanı (Iskanderûn bay) lies on the eastern side of the gulf, about 25 miles north-eastward of Resülhınzır; the town of Iskenderon (Iskanderûn) is situated on the southern shore of the 30 bay.

Sea level.—Tides are negligible, but southerly and westerly winds may sometimes raise the sea level by as much as 2 feet (0^m6), while northerly and easterly winds may lower it by a similar amount.

Aspect.—The prominent crag of Dede dağ (Dedeh Dagh), 1,400 feet 35 (426^m7) high, situated about 12 miles west-north-westward of Yurmurtalık, stands at the south-western end of the steep-sided Cebelinur (Jebel Nur) range. These mountains extend in a general north-eastward direction from Dede dağ, attaining an elevation of 2,350 feet (716^m3) in a sharp peak, $8\frac{1}{4}$ miles therefrom. 40

In the nearer mountain range, the flat-topped Taudi dağ rises to an elevation of 1,995 feet (608^m1), about 8 miles north-westward of Yurmurtalık.

The Amanus mountains reach a height of 6,049 feet (1,843^m7), about 18 miles eastward of the northern extremity of the gulf. 45

Elma (Alma) dağ, a peak, about $7\frac{1}{4}$ miles south-south-westward of Iskenderon, is 4,393 feet (1,339^m0) high, and commands the Belen (Beilen) pass, which leads to Aleppo. The Elma (Alma) dağ range has serrated sides and numerous other summits, while the sharp rocky ridge of Kızıl Dağlar (Jebel Karsarek) trends west-south-westward, 50 keeping nearly the same elevation until its wooded slopes terminate in a rugged peak, 5,474 feet (1,668^m5) high, about $3\frac{1}{4}$ miles east-south-eastward of Resülhınzır (*Lat.* $36^{\circ} 19' N.$, *Long.* $35^{\circ} 46' E.$).

Charts 2606, 2158b, 449.

Chart 2791, plan of Karataş (Karadash) road.

North-western shore.—Between Karataş burnu and a point 4 miles north-eastward, the coast is fringed with ledges of rocks, and depths of less than 3 fathoms (5^m5) extend as far as 6 cables 5 offshore.

From a point about 2 miles north-eastward of Karataş burnu several islets and rocks extend about 1½ miles east-north-eastward and afford shelter to small boats; on the coast north-westward of these islets is the village of Karataş (Karadash khan). See view on 10 plan.

A prominent single-storied coastguard station stands close north-eastward of Karataş burnu light structure (*Lat.* 36° 33' N., *Long.* 35° 20' E.); a ruined windmill, which is also a prominent landmark, is situated about three-quarters of a mile north-westward of Karataş 15 village.

Off-lying shoal.—A shoal, with a depth of 3½ fathoms (6^m9) over it, lies about 4½ miles eastward of Karataş burnu; about one mile southward of this shoal is a 6-fathom (11^m0) patch, and northward of it, for a distance of one mile, depths of 5 fathoms (9^m1) were reported 20 in 1920.

Anchorage.—Anchorage may be obtained, during summer, off the easternmost of the islets, mentioned above, in depths of from 4 to 6 fathoms (7^m3 to 11^m0), white sand.

Chart 2632.

25 **Coast.**—The coast between a point 4 miles north-eastward of Karataş burnu and a point one mile farther northward, is rocky, thence, for about 9 miles eastward, the coast is bordered by low sandhills and is almost steep-to. Good anchorage may be obtained, about one mile offshore, along this latter stretch, sheltered from strong northerly 30 winds, in depths of from 5 to 7 fathoms (9^m1 to 12^m8), sand.

From this position the coast turns to the northward and continues to be bordered with low sandhills as it trends north-north-eastward for 9 miles to the mouth of the Ceyhan nehir. It is backed by the Akyatan, an extensive salt-water lagoon, which has a shallow outlet at the point 35 where the coast turns northward.

A shoal, with a depth of 3 fathoms (5^m5) over it, lies about 2½ miles south-westward of the southern entrance point of the Ceyhan nehir and about 1½ miles offshore; it is steep-to on its seaward side.

40 *Chart 58.*

Ceyhan nehir.—The Ceyhan nehir (Jaihûn chai) (ancient *Pyramus*) is marked by high reeds along its banks and surf, which usually breaks on the bar at its entrance; the depth on the bar is variable, and occasionally impassable to boats, but there are depths of from 12 to 45 16 feet (3^m7 to 4^m9) inside. The river is about 80 yards (73^m2) wide, and is navigable as far as Kızıltatha (Misis) (*Lat.* 36° 57' N., *Long.* 35° 36' E.) (chart 2632), a distance of 24 miles, but it cannot be entered during south-easterly winds.

Caution.—The coast at the mouth of the Ceyhan nehir extends 50 about 5½ cables farther south-eastward than charted, and considerably less depths exist in this vicinity.

Yurmurtalık limanı.—Yurmurtalık limanı (Ayas bay) is entered between the mouth of the Ceyhan nehir and a point about 4½ miles north-eastward on which stands the town of Yurmurtalık (Ayas)

Charts 2632, 2606, 2158b, 449.

Chart 58.

(*Lat. 36° 46' N., Long. 35° 46' E.*). The bay is very shallow at its head and there are numerous lagoons on its southern and western shores. Farther inland to the westward the land consists of low, undulating, thickly wooded hills, while to the north-westward the hills rise to Dede dağ (page 159) in remarkable rocky pinnacles, and to Cebelinur (page 159) which, from the southward, is wedge-shaped. 5

An octagonal tower stands on the northern shore, about $6\frac{1}{2}$ cables westward of Yurmurtalık, and Bittern point, 90 feet (27^m4) high, covered with low scrub and cliffy, projects 3 cables southward from 10 the northern shore, about $3\frac{1}{2}$ miles westward of this tower.

For $1\frac{1}{2}$ miles eastward of Bittern point the northern shore of the bay has low clay cliffs, thence, as far as the tower, it is bordered by sand-hills. To the north-westward of Bittern point a dry uncultivated plain stretches to the foot of Taudi dağ (page 159). 15

Dangers.—A rocky spit, with a depth of $3\frac{1}{2}$ fathoms (5^m9) at its outer end, extends about $1\frac{1}{2}$ miles south-south-westward of the octagonal tower, mentioned above; Bittern point in line with the south-western extremity of Dede dağ (chart 2632), bearing 290° , leads southward of this spit. 20

A reef, which dries from one to 3 feet (0^m3 to 0^m9), and has a depth of $2\frac{1}{2}$ fathoms (4^m6) over it at its southern end, extends $3\frac{1}{2}$ cables south-westward from Bittern point.

A rock, with a depth of 5 feet (1^m5) over it, lies half a mile westward of Bittern point, and the ground is foul and uneven for 2 cables southward of it. 25

Shoals with depths of $2\frac{1}{2}$ fathoms (4^m6) and 3 fathoms (5^m5) over them, lie half a mile east-south-eastward, and $1\frac{1}{2}$ miles eastward, respectively, of Bittern point (*Lat. 36° 46' N., Long. 35° 42' E.*).

Anchorages.—**Directions.**—Yurmurtalık limanı affords anchorage 30 in depths of from 4 to 10 fathoms (7^m3 to 18^m3), mud, sheltered except from easterly and south-easterly winds.

Large vessels may obtain anchorage, in a depth of 6 fathoms (11^m0), soft mud, 8 cables southward of Bittern point with Dede dağ bearing 296° ; on this bearing a small piece of tableland, in the first ridge 35 of hills westward of the bay, is a little open northward of Dede dağ.

Small vessels may obtain anchorage in a depth of $3\frac{1}{2}$ fathoms (6^m4), soft mud, between the reef extending from Bittern point and the sunken rock half a mile westward of the point, with the octagonal 40 tower just open southward of the point. The holding ground in this part of the bay is considered to be generally good, but vessels sometimes drag their anchors.

A vessel approaching from the southward should pass at least one mile eastward of the entrance to Ceyhan nehir, keeping the octagonal 45 tower bearing less than 014° until Dede dağ bears 302° , when they should steer for Bittern point and anchor as directed above.

Bittern point in line with the southern peak of Cebelinur, bearing 325° , provides a clearing line for the shoal water extending from the mouth of the Ceyhan nehir, but is at present unexamined and must, 50 therefore, be used with caution and sounded continuously. See Caution on page 160.

A vessel approaching from the north-eastward should bring Bittern point in line with the south-western extremity of Dede dağ, bearing

Chart 58.

290°; this course will lead nearly half a mile southward of the spit extending south-south-westward from the octagonal tower (*Lat.* 36° 46' N., *Long.* 35° 46' E.). When clear of the spit course should be altered for the anchorage.

Chart 2791, plan of Yurmurtalık (Port Ayas).

Yurmurtalık.—The town of Yurmurtalık (ancient *Ægæ*) stands near an old ruined fort (*see* view on plan); on its eastern side are the ruins of two stone piers. Eastward of the town is a small harbour, with depths of from 3 to 15 feet (0^m9 to 4^m6), situated inside ancient moles built of large stone blocks; on the northern mole are the remains of a massive building. The harbour is reported to be silting up considerably.

Chart 2632.

Coast.—On a low promontory, 5 miles north-eastward of Yurmurtalık is a low building known as Castobolum. The coast thence rises in undulating hills from 400 to 600 feet (121^m9 to 182^m8) high, interspersed with rocky and sandy bays.

From the range of hills about 9 miles north-eastward of Castobolum, an aqueduct winds north-eastward to some extensive ruins in the middle of the plain of Issus. About 10 miles north-eastward of Castobolum is the coastguard station at Karagâh, a white building with a red roof.

Head of Iskenderon körfezi.—Obstruction.—From the northern extremity of the gulf to the town of Payas, 13 miles south-eastward, the coast is bordered by an unbroken line of sand and shingle. Some farm buildings stand about 4½ miles south-eastward of the northern extremity of the gulf and one mile inland. There is a tumulus about 3 cables within the beach, 8½ miles from the northern extremity of the gulf.

The plain of Issus, on the north-eastern shore of the head of the gulf, is marshy near the sea.

Several small streams flow out through the shingle, but none can be entered even by boats.

A plain, which is well cultivated to the foot of the hills, extends about 9 miles northward from Payas (*Lat.* 36° 45' N., *Long.* 36° 11' E.), and about 4 miles inland.

About 5 miles north-north-eastward of Payas is the town of Dörttyol whose minaret, and a large white-walled and red-roofed school, are visible from seaward. Dörttyol railway station, distinguishable by a water tower standing among trees, lies about 2 miles westward of the town.

Payas (ancient *Baiaæ*) comprises a square tower on the northern side of the promontory, a large ruined castle, a domed mosque, a minaret and a walled village. It is situated amidst groves of trees at the foot of the steep craggy Amanus mountains. The beach for a mile northward is backed by low clay cliffs.

It was intended for development as a port, but work thereon ceased in 1941 and the minor facilities then available have fallen into disuse.

Oranges, sheep, and grain are exported. Lighters are available for working cargo.

It is connected by a branch line with the Turkish railway system and is also connected to the general telegraph system.

Charts 2606, 2158b, 449.

Chart 2632.

The ancient port is now partly inland and filled with sand and stones; the moles are still visible.

Anchorage.—Good anchorage may be obtained in from 6 to 10 fathoms (11^m0 to 18^m3) about three-quarters to one mile westward of Payas tower. This anchorage is sheltered from all winds except between west-south-west and south-south-west. 5

There is open anchorage off the port in depths of from 8 to 10 fathoms (14^m6 to 18^m3), coral and sand, but from these depths the water shoals quickly towards the shore; care must be taken to avoid an obstruction 10 which was reported, in 1939, by a vessel which struck it, situated about 1½ miles south-westward of Payas tower (*Lat.* 36° 46' N., *Long.* 36° 11' E.).

Coast.—About 4 miles southward of Payas and 1½ miles inland, is the deep chasm from which the Derebani dere flows through the swamp 15 within the beach to the sea. This chasm is prominent from afar, and at its foot stand the two white, red-roofed buildings of Sariseki railway station. Half a mile south-south-eastward of the railway station lie the ruins of Kızlar Kalesi, a mediæval fortress, on the northern slope of low hills. 20

On a rocky cape, about half a mile south-westward of Kızlar Kalesi, are the Pillars of Jonas (ancient *Pylæ Syriæ*), consisting of the ruins of a limestone arch.

Chart 2188, plan of Iskenderon limanı (Iskenderün bay).

Iskenderon limanı. — Landmarks. — Iskenderon limanı lies 25 between Sahri Sakalieh point, 7½ miles southward of Payas tower, and a point about 3 miles farther south-westward. The town and port of Iskenderon (Iskenderün) are situated on the south-western shore of the bay.

The Government buildings, situated from about 5 to 7 cables eastward of the lighthouse, are conspicuous. They include the British Consulate, a large house with a verandah and many arches, the Law Courts, and the Post Office, which is white and has a clock tower. Farther inland, about 3 miles south-eastward of the lighthouse, the chasm of Yarik Kaya can be readily discerned. 35

The following other objects are prominent and easily identified:— A large building on the south-western entrance point of the bay, numerous tanks on the eastern side of the bay; a tall iron chimney, situated about 3½ cables south-westward of the light-structure on the western mole, and a chapel, standing at an elevation of 344 feet (104^m9), 40 about 2 miles eastward of the chimney.

Anchorage.—**Directions.**—Iskenderon limanı is the safest anchorage between Yurmurtalık and the coast of Israel. The only winds which blow home are northerly and these, although they occasionally interrupt landing for a few hours, are never strong enough to cause a 45 vessel with good anchors and cables to drag. The usual anchorage is northward of the town, about 3 cables offshore, in 7 fathoms (12^m8), mud.

A good position is with the Roman Catholic church (*Lat.* 36° 35' N., *Long.* 36° 10' E.), about 4½ cables eastward of the lighthouse, bearing 200°, distant 4 cables, in a depth of about 9 fathoms (16^m5), stiff mud, 50 but the holding ground generally is not good.

Caution.—A vessel approaching Iskenderon from the westward, especially at night, should not round the south-western point of the bay too closely, as the water shoals suddenly off it, and the distance

Charts 2632, 2606, 2158b, 449.

Chart 2188, plan of Iskenderon limanı (Iskanderün bay).

of the coast is very difficult to estimate, on account of the high land beyond.

Prohibited anchorage.—Anchorage is prohibited within one cable
5 of three mooring buoys off the head of the pier on the eastern side of the bay, about 2 miles north-eastward of the lighthouse. These mooring buoys are for ships using the pipe-line, which extends in a westerly direction from this pier.

Obstruction.—An obstruction lies about $2\frac{1}{2}$ cables west-north-
10 westward of the light-structure on the western mole.

Jetties.—Deepwater jetty, a modern reinforced concrete structure, where vessels up to 550 feet (167^m6) in length, and 30-foot (9^m1) draught, can berth, is situated about $1\frac{1}{2}$ miles east-north-eastward of the lighthouse. It has an overall length of 1,612 feet (491^m3), and has
15 four 6-ton mobile cranes. From the head of the jetty, for 544 feet (165^m8) of its length, it has a width of 157 feet (47^m8), and depths of from 26 to 32 feet (7^m9 to 9^m8) alongside; thence for 1,000 feet (304^m8) it is narrowed to a width of 41 feet (12^m5) and has depths of from 11 to 26 feet (3^m4 to 7^m9) alongside.

20 Inshore of this berthage is the ferry landing, 68 feet (20^m7) in length, with a depth of 11 feet (3^m3) alongside.

Town jetty, situated about half a mile eastward of the lighthouse, is 230 feet (70^m1) in length, with a depth of 10 feet (3^m0) alongside. It is, however, lightly constructed and, in 1949, was reported to be
25 in a state of disrepair. Water is laid on.

MacAndrews and Forbes jetties, which extend from the shore abreast both factories of this Firm, are each 300 feet (91^m4) long, with depths of 10 feet (3^m0) alongside each of them. They lie, respectively, about 6 cables north-westward and $2\frac{1}{2}$ cables south-eastward of Town
30 jetty (*Lat. 36° 36' N., Long. 36° 10' E.*).

A Timber jetty is situated about $1\frac{1}{2}$ cables eastward of MacAndrews and Forbes east factory jetty.

Lights.—A light (*Lat. 36° 35' N., Long. 36° 09' E.*) is exhibited, at an elevation of 49 feet (14^m9), from a white concrete tower, 66 feet
35 (20^m1) in height, standing about 3 cables south-westward of the south-western entrance point of the bay.

A light is exhibited, at an elevation of 23 feet (7^m0), from an iron column, 13 feet (4^m0) in height, on the head of the western mole, about $1\frac{1}{2}$ miles east-north-eastward of the above lighthouse.

40 Lights are exhibited from the heads of Deepwater and Town jetties.

Lighter harbour.—Two moles, with stone-built quays on their inner sides for about half their length, known as the northern and eastern moles, respectively, from a basin at the head of the bay, called Lighter harbour. The northern quay is 410 feet (125^m0) long, and the
45 western quay 328 feet (100^m0) long, with depths of from 8 to 10 feet (2^m4 to 3^m0) alongside each of them. Water is laid on to the northern quay.

South-eastern quay, on that side of Lighter harbour, is 1,230 feet (364^m9) long, with depths of from 8 to 10 feet (2^m4 to 3^m0) alongside.

50 Two 5-ton travelling cranes and one 3-ton fixed crane are available.

Port facilities.—There are no large-scale repair facilities. In the south-western corner of Lighter harbour there is a repair yard for small craft.

Small stocks of coal are maintained by State Railways and Port

Charts 2632, 2606, 2158b, 449.

Chart 2188, plan of Iskenderon limanı (Iskenderin bay).

administration. Bunkering can be carried out at Deepwater jetty, or from lighters at anchor.

Oil is available in large quantities and is piped to Deepwater jetty.

Three tugs, ten 100-ton barges and six 30- to 50-ton lighters are available; there are also a few motor launches. The number may, however, vary, as these craft are transferable to and from Mersin, according to requirements.

There is a water boat with a capacity of 42 tons.

Meat, eggs, and vegetables are plentiful. An ice-factory, with cold storage chambers, is situated about a quarter of a mile westward of Lighter harbour.

There is a hospital in the town.

Trade.—Shipping.—The chief imports are manufactured goods, rice, sugar, coffee, salt, copper, iron, hardware, cloth, indigo, cochineal, skins, and yarn.

The principal exports are wool, cotton, grain, wax, hides, olive oil, oranges, liquorice root, scammany root, galls, yellow berries, butter, apricot kernels, sesame, millet, silk, poppy seed, cattle, goats, sheep, and manufactured goods.

In 1947, a total of 222 vessels over 500 net tons, with an aggregate net tonnage of 443,320 tons, entered the port.

Iskenderon.—Iskenderon (ancient *Myriandus*) (*Lat.* 36° 35' N., *Long.* 36° 09' E.) owes its importance to being the only deep-water port in south-eastern Turkey, and its situation at the terminus of a railway, which connects it with Aleppo and Irak. In 1948, the population was estimated to be about 20,000 and to be increasing.

It is also the port of Aleppo, to which there is a motor road, 100 miles in length, which runs through the Beilen pass, about 6½ miles westward of the town, at an elevation of 2,240 feet (682m).

Communications.—Iskenderon is connected to the general railway, telegraph, and telephone systems. There is steamer communication with other Mediterranean ports.

Consul.—A British Consular Officer resides at Iskenderon.

Deratisation.—*See* page 15.

Winds.—Northerly gales during the winter do not cause a heavy sea but raise a surf on the beach which prevents landing. It is reported that a good sign of the approach of a northerly gale is a collection of fleecy clouds over the Plain of Issus, and that the disappearance of these clouds indicates a cessation of the wind. The gales usually commence at sunrise or sunset, and lull about noon, and also just after sunset, when landing is usually possible. Northerly gales are sometimes followed by a south-westerly swell, from which Deepwater jetty is unprotected.

Occasionally, in winter, a local south-easterly wind, called “Yarı Kaya,” from the chasm of that name, already mentioned, blows with great violence.

Chart 2632.

South-eastern shore of the Gulf of Iskenderon.—Anchorage.—From Iskenderon lighthouse to the coastguard station at Çerkeztunegi, about 6 miles south-westward, the coast consists of rocks and shingle and behind it lies the flat, cultivated, and in parts swampy, plain of Iskenderon. Thence to a point about 10 miles south-westward of Iskenderon lighthouse the coast becomes steeper, rising abruptly to

Chart 2632.

the foothills of Ada tepe, about 700 feet (213^m4) high ; these hills have low scrub and a few trees on them and are partly cultivated. From Ada tepe a similar cultivated plain commences and extends inland to
 5 the foot of the lofty Kızıl dağlar and south-westward to the foot of Kabayar tepe which extends about 5 miles north-eastward from Resülhınzır.

About 14 miles south-westward of Iskenderon lighthouse is the low promontory of Gülcihan with sandy cliffs on its northern side.

- 10 Arsúz (Arsus) (ancient *Rhossus*), a small village set in olive groves, about 17 miles south-westward of Iskenderon, stands on both sides of a shallow stream flowing into the southern part of a bay, the entrance to which is 2 miles wide. The ruins of the ancient walls of the town are still visible on the south-western side, and a white mosque stands,
 15 among trees, near the north-eastern entrance point of the bay, which is low and rocky.

Good anchorage may be obtained in the summer, in a depth of 4½ fathoms (8^m2), sand, inside a rocky ledge, over which there is a depth of 3 fathoms (5^m5), extending about one mile south-westward
 20 from the north-eastern entrance point of the bay.

A temporary anchorage may be obtained off Kısılçay (Burunli) (*Lat.* 36° 22' N., *Long.* 35° 49' E.), situated 4 miles south-south-westward of Arsúz.

- Resülhınzır (ancient *Rhossicus Scopulus*), the western termination
 25 of Kızıl Dağlar, rises to an elevation of 5,474 feet (1,668^m5), about 3 miles east-south-eastward of the cape ; it is steep-to and has the appearance of a boar's snout from seaward. The mountains in the vicinity are densely wooded.

Light.—A light is exhibited, at an elevation of 357 feet (108^m8),
 30 from a white tower, about 16 feet (4^m9) in height, on Resülhınzır.

COAST.—About 2 miles southward of Resülhınzır is a cliffy point, from which a rocky ledge extends about three-quarters of a mile south-westward, with a rock, awash, at its outer end. In this vicinity a vessel should keep at least 1½ miles from the coast.

- 35 The green hills westward of Arsúz, bearing about 046°, open north-westward of Resülhınzır, lead north-westward of the above-mentioned rocky ledge.

Bay of Antakya.—The Bay of Antakya (Antioch) lies between the cliffy point, 2 miles southward of Resülhınzır, and Er Rās el Basit
 40 (Bazit), 26 miles farther southward. Between its northern entrance point and Rās el Mina, 11½ miles south-south-eastward, the coast is bordered by long beaches with occasional cliffs and off-lying rocks, none of which, however, are more than 3 cables offshore. The land is steep and densely wooded, and rises to the Musa Dağı (Jebel Musa)
 45 range (ancient *Mons Pieria*), the summit of which, 2,860 feet (871^m7) high, lies about 3 miles north-north-eastward of Rās el Mina (*Lat.* 36° 08' N., *Long.* 35° 55' E.). There are numerous deep ravines on the western slope of the range, down which streams run during the greater part of the year.

- 50 Rās el Mina is well defined and prominent ; a white islet and several rocks lie off it ; a plain extends about 5 miles southward from the point to the mouth of the Nehir el 'Asi (Aasi). The extensive ruins of the ancient city and port of *Seleucia Pieria* lie close south-eastward of

Chart 2632.

Rās el Mina ; they have a white appearance and are visible from a considerable distance seaward.

Two miles southward of *Seleucia Pieria* and near the beach, is a white-domed tomb. Landing on the beach in this locality is sometimes dangerous on account of the heavy surf. Süveydiye (Suweidiya) village, $1\frac{1}{2}$ miles inland from the tomb, is marked by a clump of poplar trees. 5

Nehir el 'Asi or Orontes river (ancient *Axius*) flows out near the middle of a long line of beach ; it is a sluggish stream and has a depth of 9 feet (2^m7) within the bar ; on the bar the depths vary from 3 to 6 feet (0^m9 to 1^m8), but during the summer it is difficult to enter even in a small boat ; in the winter the river is navigable for small craft for about 3 miles. 10

Anchorage.—The usual anchorage for vessels communicating with Antakya (Antioch) is off Nehir el 'Asi bar, in a depth of 9 fathoms (16^m5), mud, half a mile offshore. The anchorage is exposed to winds from north-west, through west, to south-west, and a heavy swell sets in and breaks on the bar. 15

Antakya.—Antakya (Antákiyeh) is situated on the left bank of the Nehir el Asi, and is 13 miles from the sea direct, or 20 miles by the course of the stream. 20

Coast.—About 11 miles southward of Rās el Mina is the entrance to Qasab (Kessab) bay, 2 miles eastward of which is Cebel Akra (Akkra) (ancient *Casius*), 5,800 feet ($1,767^m8$) high, and rising abruptly is conspicuous from southward ; the upper part is entirely bare, but the base, and ridges which branch eastward, are densely wooded. 25

Anchorage may be obtained by small vessels in Qasab bay, in depths of from 7 to 10 fathoms (12^m8 to 18^m3), or in a depth of about 19 fathoms (34^m7), sand, about $3\frac{1}{2}$ cables offshore ; with the ruins on the southern side of the bay bearing 158° and the southern entrance point, 225° . 30

Charts 2606, 2158b, 449.

CHAPTER V

CYPRUS

CLIMATE AND WEATHER.—*See page 16 et seq.*

Chart 2074.

WESTERN AND SOUTH-WESTERN SIDES OF CYPRUS.—

Coast.—Cape Arnauti (ancient *Acamas*), the north-western extremity of Cyprus, is a sharp, low headland, and the commencement of a range of moderate height, which extends south-south-eastward through the island. The cape rises to a double peak, 683 feet (208^m2) high, about one mile southward and is surmounted by a ruined building; its western side is very steep, but the eastern is thickly wooded, and slopes gradually to the beach.

A ledge of sunken rocks extends about 4 cables northward from the cape, and on its outer end is Mazaki islet; a ridge of foul ground with depths of from less than 6 fathoms (11^m0) over it, extends about 3 cables northward from the islet.

The coast between Cape Arnauti (*Lat. 35° 06' N., Long. 32° 17' E.*) and Cape Yeranistou, about 5 miles southward, and thence to Lara point, 4 miles farther southward, is high, cliffy and precipitous. Ledges of sandstone rocks, nearly awash, fringe the coast between the two capes.

Koppo islet, 5 feet (1^m5) high, lies close offshore, about one mile north-north-westward of Cape Yeranistou, and about three-quarters of a mile southward of the islet is another about 5 feet (1^m5) high, with a rock, 3 feet (0^m9), about 3 cables inshore. The depths are irregular in this vicinity and shoal water extends about 1½ miles offshore. *See view facing this page.*

The coast between Cape Yeranistou and Lara point forms a bight, into which torrents from the adjacent hills flow in winter. The western side of Lara point is cliffy; boats occasionally shelter on its northern and southern sides. Between Lara point and Cape Drepanum, 2½ miles southward, there is a bight, in which there are several sandy bays, open to seaward. *See view facing this page.*

Charts 2074 and 846, with plan of Paphos.

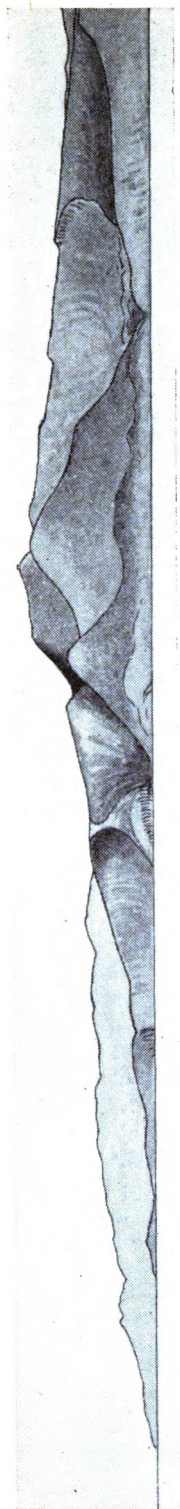
Cape Drepanum is relatively low and flat in comparison with the coast northward and has several rocks and sunken ledges off it. A white church with a red roof stands near the extremity of the cape and is conspicuous, particularly in the afternoon light. Ayios Yeorgiou (St. Yeorgiou), a flat-topped islet 72 feet (21^m9) high, lies a quarter of

Chart 2606.

Pomas point.

683-foot summit.

a



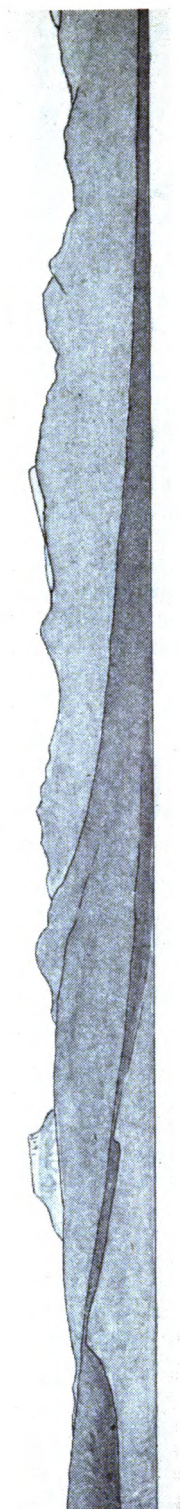
C. Arnauti, bearing about 076°, distant about 3·2 miles.

a

1,215-foot summit.

Skotini.

b



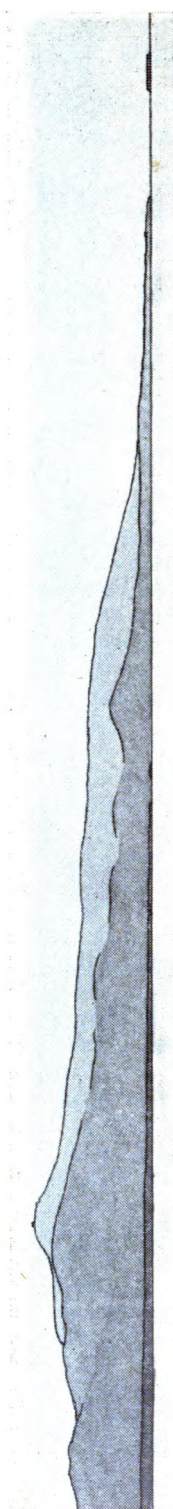
a

St. George's church.

b

Conspicuous church.

Ayios Yeorgion.



b

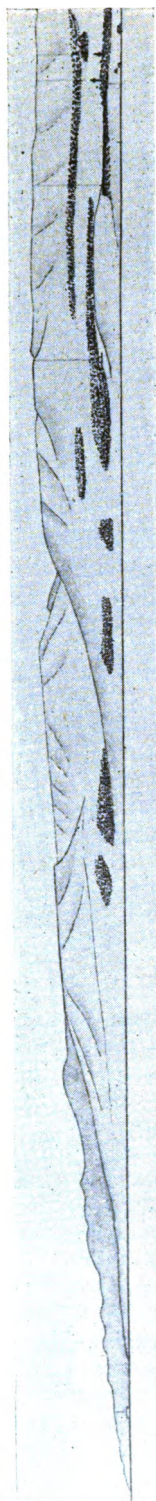
C. Drepanum.

View, in three parts, of the western coast of Cyprus between Cape Arnauti and Cape Drepanum.

(Original dated 1947.)

Cape Arnauti.

White dome.



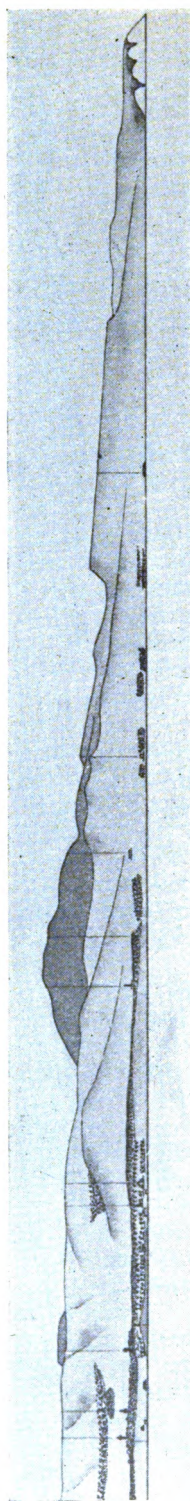
Ayios Yeorgion.

Krima.

N. Minard. Belfry.

Troodos range.

Cape Aspro.



*Paphos point Lt. Ho.,
bearing 050°, distant 4½ miles.*

Chimney.

Moulia rocks.

View, in two parts, of the south-western coast of Cyprus between
Cape Arnauti and Cape Aspro.

(Original dated 1935.)

Charts 2074 and 846, with plan of Paphos.

a mile westward of the cape and Maniki islet, 27 feet (8^m2) high, about one mile south-south-eastward.

The coast between Cape Drepanum and Paphos point, the extremity of a low peninsula, about 10 miles south-south-eastward, is bordered with sunken rocks, which extend up to about a quarter of a mile offshore in places. There are two bays about 3½ miles south-eastward of Cape Drepanum, the north-western one being used as a loading place for local produce. The village of Peyia lies on the slopes about 2 miles inland. Orphourous islet, about one foot (0^m3) high, lies about 2 miles north-north-westward of Paphos point, and 4½ cables offshore; there are several sunken rocks between the islet and Paphos point (*Lat.* 34° 45' N., *Long.* 32° 25' E.).

Except in very calm weather, the sea breaks constantly on the reefs and ledges of rocks off the coast from Cape Arnauti to Paphos point.

Light.—A light is exhibited, at an elevation of 118 feet (36^m0), from a white circular stone tower, 65 feet (19^m8) in height, about half a mile north-eastward of Paphos point.

Port Paphos.—**Buoyage.**—Port Paphos lies on the southern side of the peninsula of which Paphos point is the extremity, and within two moles formed of rocky boulders; on the western mole is an ancient fort, 46 feet (14^m0) high, with a flagstaff. There are depths of from 7 to 9 feet (2^m1 to 2^m7) in the entrance, and similar depths over a small area off the pierhead inside, where vessels of light draught with local knowledge may take shelter, except in south-easterly gales, which cause a considerable swell. The port should be approached with caution.

The approach channel to the pier is marked by two pairs of white oil-drum buoys. There is an iron pier, 158 feet (48^m1) in length, on which there is a 1½-ton crane, with a depth of 6 feet (1^m8) at its head.

Ktima town, about a mile northward of the harbour, is the capital of Paphos district. Paphos, which is a Port of Entry, had a population in 1948, of 6,015.

Paphos lighthouse is conspicuous. Other prominent objects in the vicinity are the fort, the dome of a church, 98 feet (29^m9) high, about half a mile east-north-eastward of the fort; a white belfry and two minarets in Ktima; a 329-foot (100^m3) chimney about 2½ miles eastward of the lighthouse and a large red-roofed shed, 240 feet (73^m1) high, about half a mile south-eastward of the chimney.

There is a Custom house, with a flagstaff, 46 feet (14^m0) high, at the root of the pier.

The district is fertile, producing grapes, raisins, carobs, onions and other vegetables, flax, hemp and fruit which are exported from Paphos between April and November.

Shoals.—A narrow shoal, with depths of 3 fathoms (5^m5), or less, over it, extends about 3 cables southward from the harbour entrance; a 3-fathom (5^m5) patch lies about 1½ cables further southward. A shoal, over which there is a depth of 2½ fathoms (4^m6), lies 1½ miles south-south-eastward of Paphos Point lighthouse (*Lat.* 34° 45' N., *Long.* 32° 24' E.).

Anchorage.—**Directions.**—Anchorage off Paphos is not good, being exposed to westerly and southerly winds; the holding ground, of coarse sand and shell, is poor. A suitable position, in a depth of

Charts 2606, 2074.

Charts 2074 and 846, with plan of Paphos.

about 14 fathoms (25^m6), is with Paphos lighthouse bearing 360° , distant about 9 cables.

Moderate winds from between south-east and south-west, from 5 October to April, prevent vessels from working cargo.

Approaching from northward, from a position about one mile westward of Orphuorous islet, steer to pass about the same distance westward of Paphos point until the highest Moulia rock (*see* below) bears 125° , and then steer for it on that bearing; when Paphos Point 10 lighthouse bears about 050° , steer for the anchorage.

Approaching from eastward or south-eastward, bring the western extremity of Paphos point to bear 338° and keep it so; this line of bearing leads south-westward of Moulia rocks to the anchorage.

Port facilities.—Fresh provisions can be obtained; fresh water 15 is laid on to the pier. Paphos is connected to the general telegraph and telephone systems.

There is a hospital at Ktima.

There is a regular motor car service to Limassol and Nicosia.

Charts 846, 850.

20 **Coast.**—The coast between Paphos point (*Lat.* $34^\circ 45' N.$, *Long.* $32^\circ 24' E.$) and Cape Aspro, about 16 miles east-south-eastward, is low for 10 miles after which it becomes cliffy, rising to the bold headland of the cape. The former part has beaches of sand and stones or shingle which decrease in number after the cliffs are reached.

25 Rocks and sunken ledges are numerous off the coast but do not extend more than 2 cables offshore; those 4 miles westward of Cape Aspro are known as Petra tou Ramiou, or by the legendary name of Venus rocks.

A white house with a red roof stands among the trees about 2 miles 30 south-eastward of Paphos Point lighthouse, and about 4 cables inland.

A black rock, 8 feet (2^m4) high, is situated about $5\frac{1}{2}$ miles south-eastward of Paphos Point lighthouse and about half a cable offshore.

Zephyros point lies about 7 miles south-eastward of Paphos Point lighthouse; a rock, 8 feet (2^m4) high, lies close southward of the 35 point.

The villages of Timi, Mandria, Lizata and Kouklia are situated between 5 and 8 miles south-eastward of Port Paphos, but are not readily discernible from seaward. There is a large tree at Lizata. Kouklia, the largest of the four, exports the carobs grown in the neigh- 40 bourhood, loading them by wading out to lighters or small craft off the beach southward of the village.

Inland the hills are considerably broken up, forming no clearly defined summits, with the possible exception of a rounded hill, 1,345 feet (410^{m0}) high, about $6\frac{1}{2}$ miles east-north-eastward of Port Paphos (*Lat.* 45 $34^\circ 45' N.$, *Long.* $32^\circ 24' E.$). *See* view facing page 169.

Chart 846, plan of Paphos.

Off-lying rocks.—**Channel.**—Moulia rocks lie about $2\frac{1}{2}$ miles south-eastward of Paphos Point lighthouse. They consist of three dark-coloured above-water rocks, the north-westernmost, and highest, 50 of which is 9 feet (2^m7) high; a detached ledge of sunken rocks, on which the sea breaks constantly, extends about half a mile west-south-westward from them.

There is a channel about 3 cables wide between these rocks and the coast to the northward, with depths of from 3 to 4 fathoms (5^m5 to

Charts 2606, 2074.

Chart 846, plan of Paphos.

7^m3) in it ; it should, however, only be used in calm weather by vessels with local knowledge and a maximum draught of 12 feet (3^m7).

Anchorage.—A vessel unable to enter Port Paphos may, during the summer, obtain anchorage, with good holding ground and fair shelter from westerly winds, about 3 cables eastward of Moulia rocks in a depth of 7 fathoms (12^m8), sand and mud. This is the best anchorage off this coast. 5

Current.—In May 1935, the current was observed, in a position about 6½ miles southward of Paphos point, to set east-south-eastward at a rate of between half and three-quarters of a knot. 10

Chart 850.

Coast.—Cape Aspro (*Lat. 34° 38' N., Long. 32° 42' E.*) lies at the southernmost point of the line of cliffs, previously mentioned, which extend about one mile eastward of the cape where the coast turns sharply to form a small bay, known as Pissouri bay. These cliffs are divided into three main parts, being separated by two water courses. They are light-coloured, sheer and magnificent, reaching a maximum elevation of 730 feet (222^m0) about one mile westward of the cape. About one mile northward of the cape the land rises to an elevation of 905 feet (275^m8). *See view facing page 172.* 15 20

Depths of 3 fathoms (5^m5), or less, extend about 4 cables east-south-eastward of the cape.

Episkopi bay.—**Shoal.**—**Depths.**—The coast from Cape Aspro trends east-north-eastward for 8½ miles and thence south-south-eastward for 6½ miles to Cape Zevgari, forming Episkopi bay. 25

The northern shore of the bay is a succession of small sandy bays and, towards its eastern end, is backed by high white cliffs. The eastern shore is a low shingle beach to within 1½ miles of Cape Zevgari, whence it becomes cliffy and fronted by off-lying rocks. The land close inshore of Cape Zevgari rises to an elevation of 100 feet (30^m4). *See view facing page 172.* 30

Pissouri bay, already mentioned, and Evdhimou bay, two of the small sandy bays on the northern shore of the bay, are situated about one mile and 3½ miles eastward, respectively, of Cape Aspro (*Lat. 34° 38' N., Long. 32° 42' E.*). Trading stations are established at each of these two bays and consist of a number of red-roofed store sheds and an iron jetty, with a depth of 6 feet (1^m8) at its outer end in both cases. At Pissouri there is also a Customs Guard house and office with a small flagstaff. 35 40

Provisions and water may be obtained in small quantities from both Trading stations.

Episkopi village stands on the slope of the hills which extend to the plain of Akrotiri peninsula (*see below*) and is situated about one mile inland from the north-eastern corner of Episkopi bay. It has a minaret which, however, is difficult to distinguish amongst the tall cypress trees surrounding it. Three cables north-eastward of the minaret is a church, consisting of a white building with a red roof, which can be more readily identified. The broad river bed of Kouris Potomos passes close eastward of the village and enters the sea about 5 miles northward of Cape Zevgari. 45 50

About 1½ miles eastward of Episkopi is Kolossi village and tower. This latter was built by the Knights Templar during their occupation of the island but is not, however, visible from seaward on all bearings.

Chart 850.

Jubilee shoal, with a least depth of 8 fathoms (14^m6) over it, lies about 1½ miles south-south-eastward of Cape Aspro (*Lat.* 34° 28' N., *Long.* 32° 42' E.). With the exception of this shoal the depths in 5 Episkopi bay are regular.

Anchorage.—Anchorage, with good holding ground, may be obtained on the 10-fathom (18^m3) line in any part of Episkopi bay, mud and sand

Small vessels may obtain good anchorage off Pissouri Trading 10 station, with the jetty bearing 332°, and Cape Aspro bearing 272°, in a depth of 5½ fathoms (10^m1), mud and sand, or off Evdhimou Trading station, with the jetty bearing 360°, and Cape Aspro, in line with a point 7 cables eastward of it, bearing 263°, in a depth of 5½ fathoms (10^m1), sand These two anchorages are, to a certain 15 extent, sheltered by Cape Aspro from westerly winds, but the bay is exposed to southerly and south-west winds

SOUTHERN SIDE OF CYPRUS.—Akrotiri peninsula.

Akrotiri peninsula, with Cape Zevgari and Cape Gata projecting from its south-western and south-eastern extremities, respectively, extends 20 5 miles southward from the general coastline and is the southern extremity of Cyprus. *See* view facing this page.

The highest part of the peninsula is at its southern end, with an elevation of about 200 feet (61^m0). A large salt lake, with a depth of about 4 feet (1^m2), lies in the middle of the peninsula, the land on 25 either side being very low. Southward of the lake, at its western end, is the village of Akrotiri.

Akrotiri church, a white building with a red roof, is visible from seaward on either side of the peninsula. About 1½ miles eastward of the church are the ruins of a monastery.

30 Cape Zevgari (*Lat.* 34° 34' N., *Long.* 32° 56' E.) is a toe, 2 cables wide, projecting about half a mile from the south-western end of Akrotiri peninsula, and sloping down to a height of 27 feet (8^m2) at its extremity.

A rock, 7 feet (2^m1) high, lies one cable westward, and two rocks, 35 8 feet (2^m4) and 9 feet (2^m7) high, respectively, southward of the cape. A narrow rocky spit, with depths of less than 3 fathoms (5^m5) over it, extends about half a mile west-south-westward from the cape.

Vatha, a rock, 14 feet (4^m3) high, with sunken rocks around it, lies close offshore about 2 miles eastward of Cape Zevgari.

40 Between Cape Zevgari and Cape Gata the coast of the peninsula is mainly cliffy and steep-to with sunken rocks close offshore. There are numerous indentations, one of which, one mile westward of Cape Gata, forms a remarkable cove.

Light.—A light is exhibited, at an elevation of 190 feet (57^m9), 45 from a conspicuous white stone tower, 30 feet (9^m1) in height, situated about three-quarters of a mile westward of Cape Gata. In thick weather three white patches may be seen before the lighthouse is visible.

Chart 846, plan of Limassol.

50 **Coast.**—Cape Gata (ancient *Curias prom*) is a sheer cliff, 170 feet (51^m8) high. A low rocky point projects one cable eastward from the cape from which a spit, with depths of from 2½ to 5½ fathoms (5^m0 to 9^m6), extends 5 cables southward and 6½ cables south-eastward. An

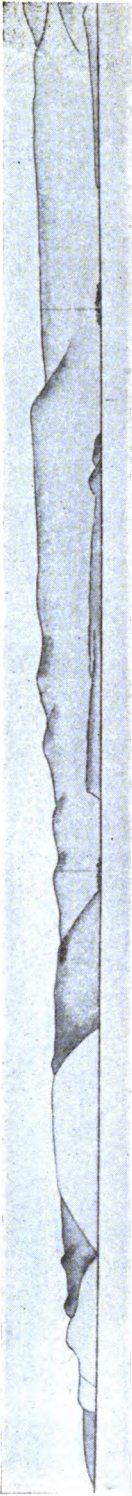
Charts 2606, 2074.

Cape Aspro,
bearing 313°
distant 5½ miles.

White cliffs.

Pissouri, station.
Trading

a



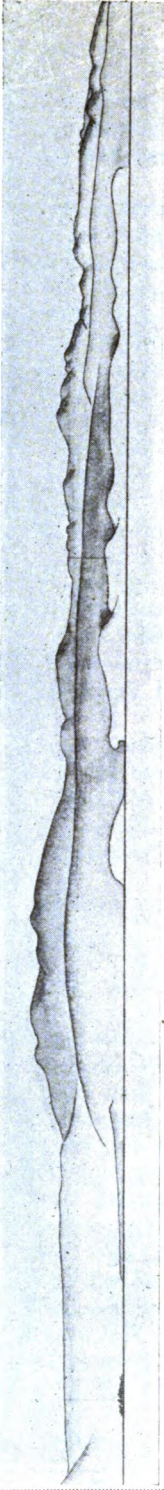
Evdhimon.

Troddos range.

White cliffs.

a

b

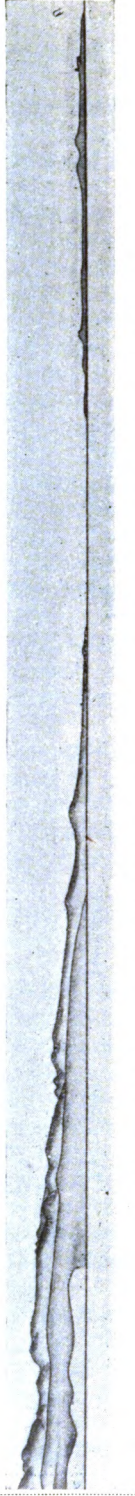


b

Cape Galla
lighthouse.
Cape
Zevgari.

Akrotiri peninsula.

b



View, in three parts, of the southern coast of Cyprus between
Cape Aspro and Cape Zevgari.

(Original dated 1935.)

To face page 173.

Cape
Gata. Lighthouse.

Akrotiri church.

Cape
Aspro. a



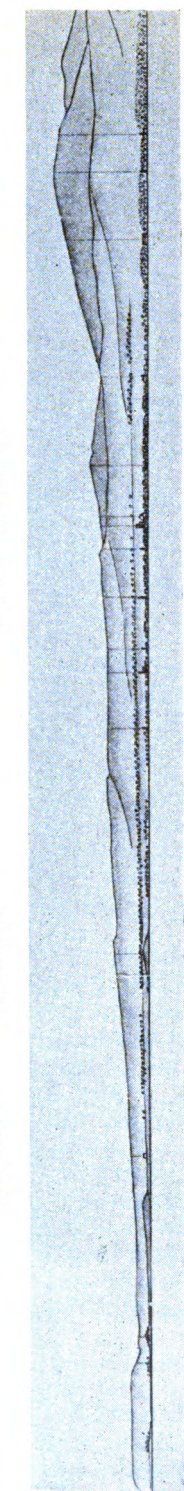
a

Limassol
water tower,
bearing 812°
Jami Jedd
minaret, distant 5½ miles.

b

143-foot hill.

Kolossi tower.



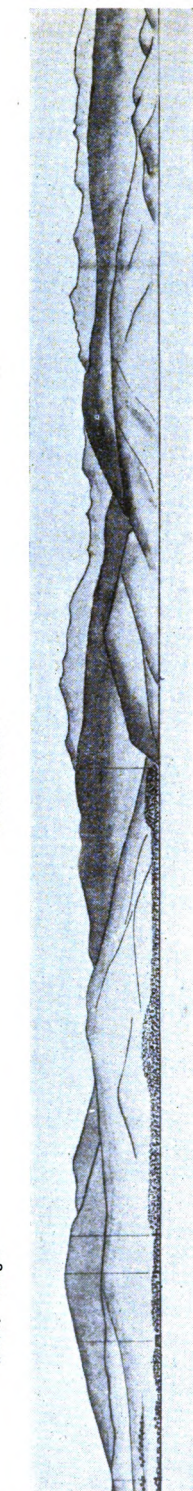
a

b

Asbestos Troïdos
works, range.

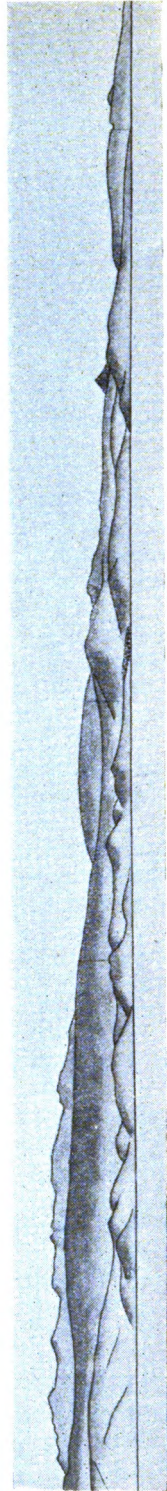
Amathus river.

c



b

c



c

480-foot summit.

Monti river.

Mount Siatrovouni.

Cape Dolos.

View, in four parts, of the southern coast of Cyprus between
Cape Gata and Cape Dolos.
(Original dated 1885.)

Chart 846, plan of Limassol.

area of foul ground lies about a quarter of a mile eastward of the point.

Current.—In July 1935, in a position $1\frac{1}{4}$ miles south-south-westward of Cape Gata lighthouse, the current was observed to set east-north-eastward at a rate of slightly less than three-quarters of a knot. 5

Charts 846, plan of Limassol, 850.

Akrotiri bay.—**Light.**—The coast from Cape Gata trends north-westward for 2 miles and thence northward and north-eastward for 5 miles to Limassol whence it trends east-north-eastward and eastward for 12 miles to Cape Dolos (*Lat. $34^{\circ} 42' N.$, Long. $33^{\circ} 16' E.$*), forming Akrotiri bay. For the first two miles it is rocky and fronted by rocky ledges and backed by the slopes of high land at the southern end of Akrotiri peninsula. From thence it consists of shingle with a belt of coarse black sand, containing about 5 per cent. of magnetic or black iron oxide, as far as Limassol. Landing in boats on the beach is, in most cases, hampered by sandy ridges, with depths of from 2 to 3 feet (0^m6 to 0^m9) over them, lying about 30 feet (9^m1) offshore. 10

Eastwards of Limassol the coast is mainly shingle until within $3\frac{1}{4}$ miles of Cape Dolos, where the Moni river enters the sea; thence it becomes rocky with detached rocks lying up to about one cable offshore. Light-coloured, broken hills, sparsely wooded, form the background from 5 miles eastward of Limassol to Cape Dolos. 20

The ruins of ancient *Amathus*, once famous for its metals, are situated on the coast, 5 miles east-north-eastward of Limassol, but few traces of its harbour now remain except for a massive wall near the beach. 25

Akrotiri bay is deep and free from dangers. A vessel approaching from the westward should round Cape Gata at a distance of not less than one mile, or in depths of more than 20 fathoms (36^m6). The bearing of Cape Zevgari should be more than 278° until Limassol water tower bears 354° when course may be altered for Limassol. 30

Chart 846, plan of Limassol.

A light is exhibited, at an elevation of 80 feet (24^m4), from a red mast, 50 feet (15^m2) in height, situated near the root of the pier at Limassol (*Lat. $34^{\circ} 40' N.$, Long. $33^{\circ} 03' E.$*). 35

Anchorage.—Anchorage may be obtained anywhere off the town of Limassol from 4 to 8 cables offshore, in depths of from 7 to 15 fathoms (12^m8 to 27^m4). A good position is with the water tower bearing 296° and the asbestos works 024° , in a depth of 7 fathoms (12^m8), mud and sand. The holding ground is good and, although the anchorage is exposed to the southward and eastward, vessels with good anchors and cables do not drag in winds of gale force. North-easterly gales occur from October to April and, during these months, it is usual to anchor in about 12 fathoms (21^m9). During the summer the prevailing winds are westerly, sometimes reaching gale force in the afternoons and making boat work uncomfortable. For this reason it is advisable for small vessels to anchor farther to the south-westward. 45

The quarantine anchorage, indicated by pecked lines on the chart, is situated about one mile southward of the Customs main pier. 50

Limassol.—**Landmarks.**—Limassol is one of the principal ports of Cyprus and is 54 miles from Nicosia, the capital of the island, to which it is connected by a good road.

Approaching the port the following objects are conspicuous and

Charts 2074, 2606.

Chart 846, plan of Limassol.

easily identified:—The water tower, 182 feet (55^m5) high, situated about 7 miles northward of Cape Gata; the chimney of the wine factory (*Lat.* 34° 40' N., *Long.* 33° 02' E.), which stands about 6 cables south-south-westward of the Water tower, and the white-roofed building of the asbestos works, situated about 11½ cables north-eastward of the water tower.

From the anchorage the following additional objects are prominent :—The blue dome of Ayia Napa church, about 4 cables south-south-eastward of the water tower; the minarets of Jami Kebir and Jami Jedid mosques, 99 feet and 109 feet (30^m2 and 33^m2) high, about one cable and 3 cables south-westward, respectively, of the blue-domed church; the Custom House flagstaff, 66 feet (20^m1) high, situated near the root of the main pier; the flagstaff of the yellow stone Government offices, about 2 cables northward of the Custom house; the English club, with its verandah built out over the sea, and the twin belfries of the Roman Catholic church, situated about 3 cables and 6 cables north-eastward, respectively, of the Custom house, and the chimneys of the soap works and carob works, 62 and 79 feet (18^m9 and 24^m1) high, respectively, standing about 1½ miles north-eastward of the Custom house.

The land rises gradually behind the town in tree-covered, wedge-shaped hills. Troodos, the Government summer station and resort for visitors, is situated in the hills 17 miles northward of the town and can be seen in the background.

Town.—Exports.—Limassol (*Lat.* 34° 40' N., *Long.* 33° 02' E.) is administered by a Commissioner assisted by a Municipal council. The population, in 1948, was 24,140. The principal exports are wine, gypsum, raisins, asbestos and carobs.

From October to March inclusive there are, on an average, from 5 to 8 days in each month on which cargo cannot be worked by vessels in the roads on account of the weather.

Piers.—The Customs main pier is an iron structure, 600 feet (183^m0) long, alongside which there is a depth of 15 feet (4^m6), where small vessels can lie. The outer 100 feet (30^m5) has a width of about 100 feet (30^m5). Trolleys on rails run from the pierhead to the Custom house. There is a 7-ton crane on the pierhead, a one-ton crane halfway along the pier, and two one-ton travelling cranes. There is a similar pier about a quarter of a cable farther south-westward.

An iron trestle pier, 160 feet (48^m7) long, with landing steps and a depth of 4 feet (1^m2) alongside, projects from the Quarantine station about 1½ cables south-westward of the Custom House flagstaff.

An iron pier projects, about one cable northward, and a small private pier, about 2½ cables north-eastward, respectively, of the Custom House flagstaff. Another pier, with a depth of 11 feet (3^m4) at its head, is situated about 11 cables north-eastward of the Custom House flagstaff.

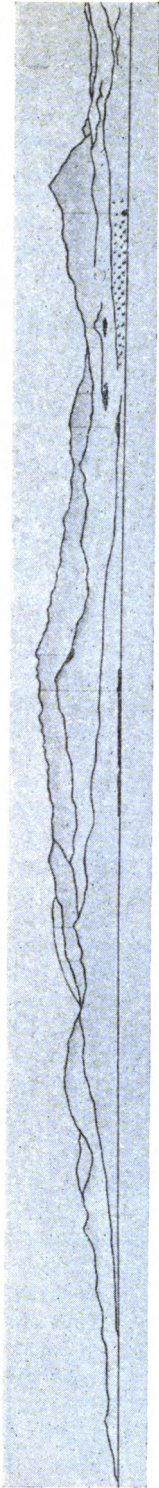
A jetty, with a depth of 11 feet (3^m4) at its head, extends from the eastern end of the town, about 7 cables north-eastward of the Custom House flagstaff (*Lat.* 34° 40' N., *Long.* 33° 03' E.).

Landing.—The proper landing place is at the Customs main pier, where there are four landing steps, one on each side of the pierhead, and two on the eastern side of the root of the pier, where there is a depth of 5 feet (1^m5). During strong north-easterly and south-

Charts 850, 2074, 2606.

Vilia.

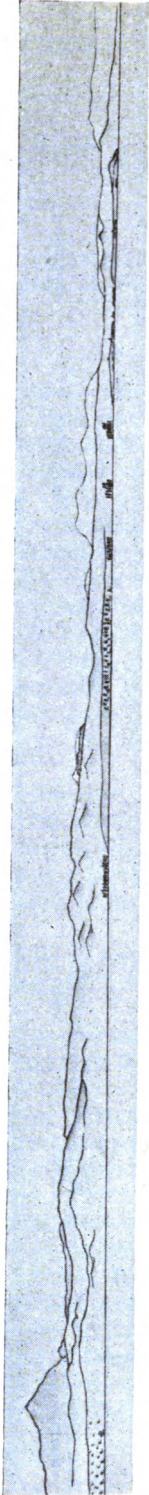
Pelounda
point Lefkara
ruin, village.



Mount Slavrocouni.

Cape Kiti
lighthouse,
bearing 003°,
distant 5 miles.

Yerako Muti.



View, in two parts, of the southern coast of Cyprus between Cape Dolos and Cape Kiti.
(Original dated 1934.)

Jami Kebir minaret,
bearing 274° ,
distant
 $5\frac{1}{2}$ miles. *Larnaca.* *a*

Hala Sultan Tekke minaret. Mount Stavrovouni.

2



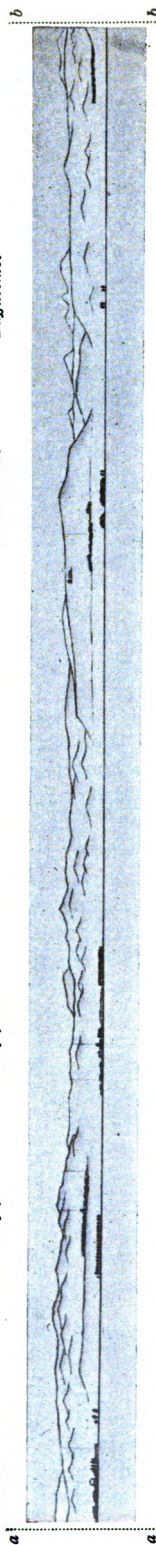
Aradhippon
belfry.

Livhadia
belfry.

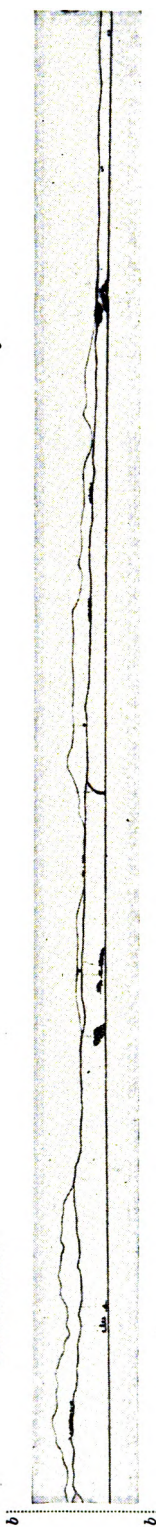
*Aradhippon
belfry.*

Yerako Muti.

Buffavento.



Dhekēlia beacon.



Ormidhea
village.

Ruined tower.

Cape Pyla



View, in four parts, of the southern coast of Cyprus between Cape Kiti and Cape Pyla.

(Original dated 1934.)

Chart 846, plan of Limassol.

easterly gales it is impossible to land at the inshore landing steps, owing to the surf.

Mooring buoys.—There are four red mooring buoys off the end of the Customs main pier. 5

Port facilities.—Provisions are plentiful. Water is laid on to the Customs main pier. No coal is available.

There is a Government hospital in the town.

Deratisation.—See page 15.

Communications.—Limassol is connected to the general telegraph 10 and telephone systems. There is a motor bus service to Nicosia, Larnaca and Paphos.

Climatic tables.—See page 35.

Charts 850, 846, plan of Vasilikos.

Coast.—**Light.**—**Anchorage.**—About 2 miles eastward of Cape 15 Dolos (*Lat. 34° 42' N., Long. 33° 16' E.*), in Vasilikos bay, there is a conspicuous loading pylon, about 85 feet (25^m9) high, from the top of which a light, privately maintained, is exhibited at an elevation of 88 feet (26^m8). (*See view facing page 177.*) This pylon, which is about 3 cables from the shore, is connected to the installations thereon, 20 by an overhead ropeway carried on three intermediate trestles; it is used for loading from iron pyrites, by means of a chain of buckets and a chute, into vessels, which berth between four large mooring buoys, each lying about a cable from the pylon. A fifth mooring buoy, about half a cable inshore of the pylon, is used for springs. The depth in 25 this berth is about 33 feet (10^m1) and ships of over 5,000 gross registered tonnage have been loaded. Pilotage by the company's pilot is compulsory for all vessels coming to or leaving the berth.

Chart 850.

The village and trading station of Zygi is situated about 1½ miles 30 north-eastward of the loading pylon, and on the eastern side of the point between Vasilikos bay and Zygi there is a pump house, standing alone, which can be identified. At Zygi there is a pier, with a depth of 6 feet (1^m8) at its head; close south-westward of the pierhead are some sunken rocks, one of which is awash. 35

Good anchorage may be obtained, in a depth of about 7 fathoms (12^m8), mud and weed, with Zygi pier bearing 322°, and the pump house, mentioned above, 276°.

Between Zygi pier and Cape Kiti, 14 miles east-north-eastward, rocks extend about 2 cables offshore in places. The high-water line 40 is principally shingle except where there are cliffs.

There are two points, named Pendaskino and Petounda, situated about 7½ and 12 miles, respectively, east-north-eastward of Cape Dolos (*Lat. 34° 42' N., Long. 33° 16' E.*), but neither is prominent. Petounda point is cliffy, 42 feet (12^m8) high, and on it there is a ruined 45 house, 8 feet (2^m4) in height; it has been mistaken for Cape Kiti.

Hills, much broken up and covered with trees, approach the coast between Cape Dolos and Petounda point. High hill, 928 feet (282^m8) high, about 2 miles northward of Pendaskino point, and the 534-foot (162^m8) summit, about 1½ miles north-westward of Cape Dolos, are 50 well defined, more particularly from eastward. These, with Zygi, the pump house westward of it and Petounda point, with its ruined house, previously mentioned, are the only identifiable objects on this stretch of the coast.

Charts 2074, 2606.

Chart 850.

From Petounda point to Cape Kiti the land near the coast is low-lying.

Depths are somewhat irregular under 12 fathoms (21^m9), the nature of the bottom changing from mud, in greater depths, to sand with rocky outcrops and patches of weed and mud.

Caution.—When navigating along this coast vessels should not approach into a depth of less than 15 fathoms (27^m4).

Charts 850, 851.

10 **Coast.**—Cape Kiti is formed of cliffs from 35 to 40 feet (10^m7 to 12^m2) high; about a mile northward a conspicuous square tower, 26 feet (7^m9) in height, stands prominently on an elevation of 63 feet (19^m2).

Two belfries, 65 and 85 feet (19^m8 and 25^m9) high, stand about 15 1½ miles west-north-westward and north-westward, respectively, of Cape Kiti, and Kiti village, with a belfry, 138 feet (42^m1) high, close northward of it, lies about 2½ miles north-westward of the cape.

The cliffs on the eastern side of Cape Kiti (*Lat.* 34° 49' N., *Long.* 33° 36' E.), although low, are white and very conspicuous, and form a 20 valuable mark in low visibility.

Shoals.—**Caution.**—Several detached shoals, with depths of from 3 to 3½ fathoms (5^m5 to 6^m9) over them, lie at distances of from 6 to 10 cables southward of Cape Kiti; depths of 5½ and 5½ fathoms (9^m6 and 10^m1) are situated about 8½ cables south-south-eastward and 10 25 cables east-south-eastward, respectively, of it. Depths of less than 5 fathoms (9^m1) extend three-quarters of a mile eastward of the cape. The cape should not be approached into a depth of less than 12 fathoms (21^m9), that is, within a distance of about 1½ miles, or with Petounda point bearing less than 258°.

30 **Light.**—A light is exhibited, at an elevation of 67 feet (20^m4), from a conspicuous white stone tower, 33 feet (10^m1) in height, on Cape Kiti.

Charts 846, plan of Larnaka, 850, 851.

Larnaca bay.—Larnaca bay is contained between cape Kiti and 35 Cape Pyla, 14½ miles north-eastward. The shore from Cape Kiti to Larnaca, about 6 miles northward, is cliffy for half a mile and thence is a stone and shingle beach, backed by an extensive plain, within which are large salt lakes.

Dades or Kokino point is situated about 3½ miles north-north-east- 40 ward of Cape Kiti; a rock, 2 feet (0^m6) high, lies about 4 cables northward of the point.

On the western shore of the northern salt lake, about 2 miles north-westward of Dades point, is a prominent mosque, called Hala Sultan Tekke, with a minaret, 103 feet (31^m4) high, and a dome.

45 Other identifiable objects in this vicinity are two salt guard huts, elevated 40 and 42 feet (12^m2 and 12^m8), situated about 1½ miles north-north-westward and northward, respectively, of Dades point.

Mount Stavrovouni, 2,258 feet (688^m2) high, 10 miles westward of Larnaca, is isolated, surmounted by a monastery and very con- 50 spicuous from any part of Larnaca bay; it is also conspicuous along the coast westward of Cape Kiti (*Lat.* 34° 49' N., *Long.* 33° 36' E.) until shut in by High hill.

The shore for 5½ miles northward and eastward of Larnaca to Dhekélia beacon, also known as Peter's cairn (page 179), is a sand and

Charts 2074, 2606.

To face page 176.

Cape Zengari.

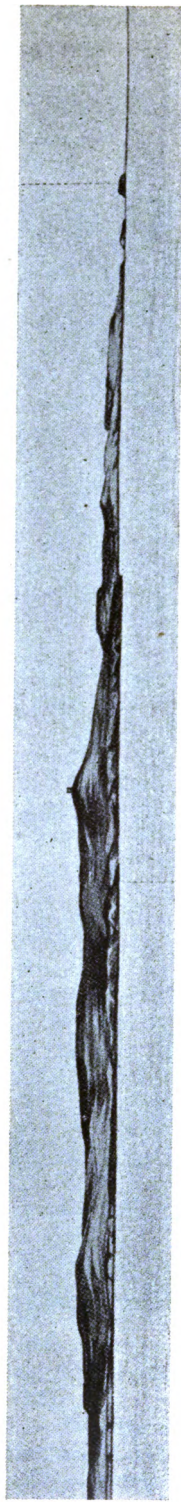
Troödos range.

Lighthouse,
bearing 036°,
distant $\frac{1}{4}$ miles. Cape
Skavrovouni,
Mounl.



Akrotiri peninsula from southward.
(Original dated 1935.)

Cape Greco.



Cape Pyla,
bearing 056°, distant 9 miles.

Capes Pyla and Greco from the southern approach to Larnaca bay.
(Original dated 1950.)

To face page 177.



Loading pylon, Vasilikos bay, bearing about 300° , $1\frac{1}{2}$ cables.
(Original dated 1947.)

Charts 846, plan of Larnaka, 850, 851.

shingle beach, backed by a slight elevation on which stand several villages. Of these, Aradippou and Livadhia, situated about $3\frac{1}{4}$ miles north-westward and $2\frac{1}{2}$ miles northward, respectively, of Larnaca, have churches with belfries; that of the former is 237 feet (72^m2) high, 5 and of the latter 117 feet (35^m7) high.

A two-storied hut, situated on the coast about 3 miles northward of Larnaca, may be readily identified.

From Dhekélia beacon eastward to Cape Pyla, the shore is rocky and backed by hills which commence with one named Yerako Muti, 10 676 feet (206^m0) high, situated about 4 miles west-north-westward of the beacon. A conspicuous tree stands near the coast about $2\frac{3}{4}$ miles eastward of Dhekélia beacon.

Cape Pyla (ancient *Dades prom*) is 311 feet (94^m8) high, and on it is a conspicuous ruined round tower, 323 feet (98^m5) high. See view D 15 on chart 2074.

Depths.—Rocks front the shore of Larnaca bay between Cape Kiti and Dades point and also between Dhekélia beacon and Cape Pyla. Depths increase rapidly; those of 100 fathoms (182^m9) are found at an average distance of $2\frac{1}{2}$ miles from the coast; there are 20 a number of indentations in the 100-fathom (182^m9) line and a remarkable one, 3 miles westward of Cape Pyla, approaches to within a mile of the coast. Shoals, with least depths of $3\frac{1}{4}$ and $4\frac{1}{4}$ fathoms (5^m9 and 8^m2) over them, are situated about half a mile eastward and $1\frac{1}{2}$ miles southward, respectively, of Dades point (*Lat.* $34^\circ 52' N.$, 25 *Long.* $33^\circ 38' E.$).

Lights.—Two lights are exhibited, at an elevation of 30 feet (9^m1), from black iron columns, one at each end of the pierhead at Larnaca.

Anchorage.—The anchorage off Larnaca is safe for well-found vessels throughout the year, but the short sea and heavy swell that 30 runs into the bay during south-easterly gales, to which it is open, render it very uncomfortable, and the swell during north-easterly and south-westerly gales makes landing difficult. Southerly and south-easterly gales usually shift to the south-westward, and, if vessels drag, it is in a direction parallel to the shore. 35

During summer the land and sea breezes are fairly regular; the latter blows along the shore from the southward.

The usual anchorage is eastward of the northern part of the town, in depths of from 10 to 15 fathoms (18^m3 to 27^m4), mud; a good position being with the pierhead bearing 272° and the shed at the inner 40 end of the salt pier, 220° .

Caution.—Anchorage should be avoided south-eastward of the southern end of the town.

Quarantine anchorage.—Vessels in quarantine should anchor northward of the usual anchorage. 45

Directions.—Vessels from the westward bound for Larnaca, after rounding Cape Kiti (*Lat.* $34^\circ 49' N.$, *Long.* $33^\circ 36' E.$) at a distance of not less than $1\frac{1}{4}$ miles, should give the coast to the northward a berth of one mile until the anchorage is reached.

Vessels from the eastward should steer direct for the anchorage 50 when southward of Cape Greco (page 179).

At night, vessels should approach on a bearing of the pierhead lights and anchor in the depth recommended. Caution is necessary as the soundings decrease rapidly from 20 fathoms (36^m6).

Charts 2704, 2806.

Charts 846, plan of Larnaka, 850, 851.

Larnaca.—The town of Larnaca extends for $1\frac{1}{2}$ miles in a north-westerly and south-easterly direction, that part of it fronting the shore being about one mile in length. The population, in 1948, was 15,245.

5 **Landmarks.**—Approaching Larnaca the following objects are conspicuous and easily identified :—The tannery, a long building, with Greek lettering on the roof, standing near the shore, about 4 cables northward of the root of the main pier, and a tall, red brick chimney, about $1\frac{1}{2}$ cables northward of the tannery.

10 Other prominent objects are :—Jami Kebir minaret, 97 feet (29^m6) high, about $3\frac{1}{2}$ cables southward of the root of the main pier, and the white dome of Santa Maria church (*Lat.* $34^\circ 55' N.$, *Long.* $33^\circ 37' E.$), 107 feet (32^m6) high, situated $9\frac{1}{2}$ cables north-north-westward of Jami Kebir minaret.

15 From the anchorage the following additional objects can be readily identified :—The Government offices, consisting of a yellow building with gables and a grey roof, and the Customs flagstaff, 76 feet (23^m1) high, both of which stand close westward of the root of the main pier ; a yellow stone fort, now used as a Police station and prison, standing
20 near the shore close eastward of Jami Kebir minaret, and the Radio masts, situated about one cable northward of the root of the main pier.

Chart 846, plan of Larnaca.

Piers.—Landing places.—The main pier is 900 feet (274^m3) long, with a sheltering arm extending 250 feet (76^m2) northward from
25 its head. There is a crane with a lifting capacity of 8 tons on the sheltering arm, one of 5 tons half-way along the pier, and two travelling cranes of $1\frac{1}{2}$ tons. Considerable silting takes place inshore of the sheltering arm, but dredging is carried out regularly to maintain a depth of at least 6 feet (1^m8) alongside the outer half of the pier (*Lat.*
30 $34^\circ 55' N.$, *Long.* $33^\circ 38' E.$), where small vessels up to 50 tons can be berthed.

One cable northward of the main pier is a jetty, with a depth, in 1949, of 4 feet (1^m2) at its head ; a line of trolley rails connects it with the petroleum store. There is a small iron jetty near the yellow
35 stone fort. The salt pier head in 1949, a depth of 5 feet (1^m5) at its head. It is connected by rails with the salt lake three-quarters of a mile inland.

There are three landing places inside the arm at the main pier, but landing in winter is sometimes impracticable, and in summer,
40 during the sea breeze, difficult ; it is dangerous with any swell, as the sea breaks some distance outside the end of the pier in even moderate weather ; there is not enough water for any craft larger than a pulling boat to go alongside in safety except in absolutely smooth water. The morning and evening are generally calm in summer, and
45 on the days when the sea breeze is very strong ; these are the best times to land. In strong north-easterly gales it is generally possible to land at Dhekélia.

From November to March inclusive there are, on an average, from about 2 to 6 days in each month on which cargo cannot be worked by
50 vessels in the roads on account of the weather.

Oil pipe-line.—Mooring buoys.—There is an oil pipe-line about 11 cables northward of the main pier ; at its seaward end are some mooring buoys to which vessels discharging oil secure.

Port facilities.—Fresh provisions may be obtained.

Charts 850, 2074, 2606.

Chart 846, plan of Larnaca.

There is a Government hospital at Larnaca.

Communications.—There are regular motor bus services between Larnaca, Nicosia, Limassol and Famagusta.

Radio station.—There is a radio station at Larnaca. *See* page 15. 5

Deratisation.—*See* page 15.

Chart 846, plan of Dhekélia road.

Dhekélia.—Dhekélia, lying about 6 miles north-eastward of Larnaca, forms an alternative anchorage and landing place to the latter port during north-easterly winds. 10

There are four coves here, all open southward, and on Quarantine point, which separates the two eastern coves, there is a quarantine station.

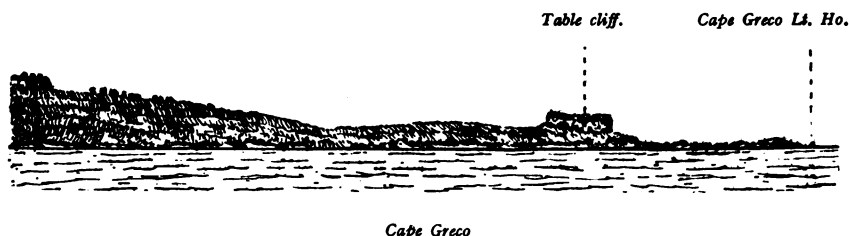
Beacon.—Dhekélia beacon (*Lat.* $34^{\circ} 59' N.$, *Long.* $33^{\circ} 43' E.$), a stone beacon painted in black and white bands and 19 feet (5^m8) in 15 height, stands, at an elevation of 35 feet (10^m7), about one mile westward of Quarantine point.

Jetty.—A jetty of steel piles and concrete, with a depth of 7 feet (2^m1) at its outer end, is situated in the small cove on the western side of Quarantine point. Boats should approach it on a north-north- 20 easterly course, making the entrance to the cove midway between a point on the western side and a rocky islet, 3 feet (0^m9) high, on the eastern side.

Anchorage.—Anchorage, sheltered from north-easterly winds, may be obtained in a depth of 15 fathoms (27^m4), good holding ground of 25 mud and weed, with Dhekélia beacon bearing 308° , and the conspicuous house on the southern extremity of Quarantine point bearing 025° . The approach is clear and deep. The soundings shoal rapidly off Dhekélia and only vessels of shallow draught should anchor inshore of the position given above. 30

Chart 851.

Coast.—The coast between Cape Pyla and Cape Greco (*Lat.* $34^{\circ} 57' N.$, *Long.* $34^{\circ} 05' E.$), 11 miles eastward, is rocky, but there are one or two coves where boats can land. A conspicuous and abrupt table cliff, 300 feet (91^m4) high, which has the appearance of an old 35



fortress, is situated a mile westward of Cape Greco. *See* sketch and views D and E on chart 2074.

Cape Greco (ancient *Pedaliium prom*), the south-eastern extremity of Cyprus, is the termination of a small peninsula, the middle of the north-western side of which is connected to the mainland by a narrow 40 isthmus; it is low and tapering, but there are depths of 10 fathoms (18^m3) about a cable offshore.

There is a bay, 5 cables wide, with rocky shores on the southern

Charts 850, 2074, 2606.

Chart 851.

side of the isthmus; the depths in it shoal from 15 fathoms (27^m4) at the entrance to 4½ fathoms (8^m2) at the head, a distance of 3 cables, the bottom being sand with patches of weed.

- 5 **Light.**—A light is exhibited, at an elevation of 52 feet (15^m8), from a white stone tower, 50 feet (15^m2) in height, on Cape Greco.

Current.—A current sets westward, past Cape Greco, at the rate of from a half to three-quarters of a knot.

- 10 An east-going current of about half a knot was, in June, 1931, experienced by H.M.S. *Ormonde* close into Cape Greco (*Lat.* 34° 57' N., *Long.* 34° 05' E.).

- Aspect.**—Behind Cape Greco, the land rises to Phano hill, 581 feet (177^m1) high, the summit of which is nearly flat with a scarp on the northern and southern sides; from here the land slopes away westward before rising again to Cape Pyla and northward in a ridge extending nearly to Famagusta, where the land becomes generally low lying. A remarkable rocky outcrop forming a knoll, 229 feet (69^m8) high with a small hut on top, is situated one mile north-eastward of Phano hill. There are numerous wind pumps, having from a distance the appearance of palms.

- EASTERN SIDE OF CYPRUS.—Coast.**—Famagusta bay lies between Cape Greco and Cape Elea, about 23 miles northward. The western shore of the bay, from a position about 1½ miles northward of Cape Greco to about 8½ miles north-north-westward, is bordered by rocky shoals which extend from about 2 to 6 cables offshore, thence it is bordered within depths of 3 fathoms (5^m5) by a line of rocks and shoals at a distance of from 2 to 2½ cables offshore and extending to a chain of rocky islets and reefs, known as The Glossa (Tongue), which projects south-south-eastward half a mile from the low sandstone point forming the southern side of Famagusta harbour.

The large white church of Ayios Memnon and Varosha water tower, situated, respectively, about 2½ and 1½ miles south-south-eastward of Famagusta, are easily identified.

Chart 847, plan of Famagusta harbour.

- 35 **Famagusta harbour.**—About 12 miles north-north-westward of Cape Greco, and 3½ cables eastward of the southern end of Famagusta town, is a point of low sandstone, from which a line of flat rocky islets extends about half a mile north-north-westward. The northernmost of these is one foot (0^m3) high, and known as Messanisi or North islet; 40 the southernmost is named Karvolos Potamothis (*Lat.* 35° 07' N., *Long.* 33° 57' E.), and between these two lie Oxo islet and an unnamed islet.

- A line of shoals extends about 1½ miles north-north-westward from Messanisi, leaving a channel between it and the shore, about 4½ cables wide.

- The area westward of these shoals is sheltered from south-easterly gales; about a cable from the shoals and 2 cables from the ancient mole extending westward from Messanisi, there are general depths of from 2 to 3 fathoms (3^m7 to 5^m5); the holding ground is better 50 farther northward.

Dangers.—About 2 cables north-north-westward of Messanisi is Black rock, or Shark's fin, which dries 2 feet (0^m6), and about half a cable farther in the same direction is White rock, which also dries

Chart 847, plan of Famagusta harbour.

2 feet (0^m6). A 4-foot (1^m2) patch lies one cable north-north-westward of White rock, and depths of from about one to 3 fathoms (1^m8 to 5^m5) extend for a distance of about 7 cables north-north-westward from the rock; thence for another half a mile in the same direction there are depths of from about 3½ to 6 fathoms (6^m4 to 11^m0). All these dangers are covered by a *red* sector of the main light (*Lat.* 35° 08' N., *Long.* 33° 56' E.) between the bearings of 216° and 313°.

Boat channel.—Beacons.—Lights.—A boat channel into the harbour, marked on either side by a beacon, lies between White rock and the rock with a depth of 4 feet (1^m2) about a cable northward; on application to the Harbour master the channel will be marked by lights on the beacons for the use of boats belonging to vessels at anchor outside the harbour.

Inner harbour.—The inner harbour lies eastward of the town, and between it and Messanisi with the islets to the southward. An ancient mole, which dries, extends about 2½ cables westward from Messanisi, and a mole extends some 75 yards (68^m6) from the town walls towards it, leaving an entrance, 360 feet (106^m7) wide, to the inner harbour.

The approach to the inner harbour is through a channel about 350 feet (106^m7) wide, between the buoys at the northern end, decreasing to 250 feet (76^m2) between the mole heads at the southern end, dredged to a depth of 23 feet (7^m0); its axis trends 159°, and leads through the middle of the entrance.

Within the entrance a basin, which extends about 3 cables south-eastward, has been dredged to a depth of 23 feet (7^m0).

An area, dredged to 9 feet (2^m7), and known as the Schooner basin, lies at the south-eastern end of the harbour; the basin is entered between two pairs of mooring buoys and its north-western and south-eastern limits are indicated by pairs of small beacons north-westward of Oxo islet.

Lights.—A light (*Lat.* 35° 08' N., *Long.* 33° 56' E.) is exhibited, at an elevation of 60 feet (18^m3), from a conspicuous white concrete structure with black stripes, 35 feet (10^m7) in height, situated on the western side of the entrance to Famagusta harbour, about a mile north-westward of the north-east bastion of the town. The light-structure is very conspicuous.

Lights are exhibited, at an elevation of 30 feet (9^m1), from black iron columns, 25 feet (7^m6) in height, on the ends of the moles.

A light, known as Djamboulat light, is exhibited, at an elevation of 62 feet (18^m9), from a stone tower, 22 feet (6^m7) in height, on the south-east bastion of the town.

Beacon.—Leading marks.—A conspicuous concrete beacon, painted in black and white bands, surmounted by a triangle, with an elevation of 35 feet (10^m7) and 28 feet (8^m5) in height, stands on the western shore of the harbour 2 cables north-eastward of the main light-structure; this beacon in line with the main light-structure, bearing 216°, leads in a least depth of 35 feet (10^m7) until Djamboulat light-structure shows between the two mole heads, bearing 159°.

Buoyage.—A light-buoy, painted in red and white bands and exhibiting a *white flashing* light *every three seconds*, is moored about

Chart 847, plan of Famagusta harbour.

8 cables north-eastward of the main light-structure (*Lat. 35° 08' N., Long. 33° 56' E.*).

The northern entrance to the dredged channel leading into the inner harbour is marked on its eastern side by a black and white striped can buoy, surmounted by a staff and cage, and on its western side by a black conical buoy, surmounted by a globe.

Mooring buoys.—There are four red mooring buoys on the eastern side of the basin in the inner harbour, for use in hauling off vessels from the wharf.

Pilot.—A pilot should be obtained by making the usual pilot signal. *Charts 847, 851.*

Anchorage.—**Directions.**—Large vessels may obtain anchorage, in a depth of about 17 fathoms (31^m1), stiff mud, with Messanisi bearing about 254°, distant 6 cables; in this locality the bottom in depths of less than 12 fathoms (21^m9) is rock and sand.

There is also anchorage in a depth of 7 fathoms (12^m8) in the channel inside the shoals with the main light-structure bearing about 277°, distant 6½ cables, but the shoals give no protection whatever to this position in north-easterly and easterly gales, therefore vessels anchored more than 3 cables from the mole should proceed to sea during a gale from this quarter.

Small vessels may obtain anchorage in the sheltered area within 3 cables of the mole in depths of from 3 to 4 fathoms (5^m5 to 7^m3), or may enter the inner harbour.

To enter the channel inside the shoals, a vessel should approach with the black and white beacon in line with the main light structure, bearing 216°, which leads close north-westward of the light-buoy; when the light-structure on the south-east bastion of the town is seen midway between the two mole heads bearing 159°, she should steer for it on this bearing, which leads into the basin. This light-structure (*Lat. 35° 07' N., Long. 33° 57' E.*) is usually somewhat obscured by fishing vessels' masts.

During strong winds a large vessel may experience difficulty in entering, and securing in the inner harbour; strong easterly winds sometimes necessitates the closing of the harbour. In summer vessels can enter at any time without difficulty. The pilot will direct the vessel to her berth.

At night, a vessel should approach in the *white* sector of the main light, bearing 207°, which leads nearly 1½ cables north-westward of the light-buoy. When the light on the south-east bastion is seen midway between the lights on the two mole heads, bearing 159°, steer for it on this bearing to the anchorage, or into the basin. *Chart 847, plan of Famagusta harbour.*

Caution.—When approaching from seaward care should be taken not to mistake the black and white striped buoy surmounted by a staff and cage marking the eastern side of the entrance to the inner harbour for the light-buoy, painted in red and white bands, marking the northern end of the line of reefs extending northward from Messanisi.

Signals.—A rectangular shape, painted black, with a white band, hoisted at the flagstaff on the square tower of the Custom house, indicates that the port is closed to steam vessels of 40 tons and over. During the time the above signal is displayed, further communication

Charts 2074, 2606.

Chart 847, plan of Famagusta harbour.

will be made to vessels, if necessary, by the International Code of Signals from the above-mentioned flagstaff, or by a daylight flashing lamp.

Winds.—Strong east-north-easterly winds are accompanied by a heavy sea, and the current sometimes sets northward, when vessels at the anchorage lie broadside on and roll considerably. Northerly winds in winter, if strong, raise a short choppy sea.

Famagusta.—Famagusta (ancient *Ammochostos*) (*Lat.* 35° 07' N., *Long.* 33° 56' E.), on the western side of the inner harbour, is enclosed by massive fortress walls on the outer sides of which is a ditch, 80 feet (24^m4) wide, and 45 feet (13^m7) deep. Openings have been made in these walls in addition to the old gates, to facilitate communication between the town and the harbour.

Landmarks.—St. Nicholas mosque, 136 feet (41^m4) high, with its minaret 163 feet (49^m7) high, situated about 2½ cables south-south-westward of the head of the western mole, is conspicuous from seaward. See view on chart 2074.

On nearer approach the following buildings are prominent and easily identified:—The white Custom house, which contains all the harbour offices, with its low square tower, situated in the middle of the main quay; the red-roofed warehouses along the quay and at the southern end of the harbour, and the Harbour master's large red-roofed house on Karavalos Potamothio islet.

Quays.—On the south-western side of the inner harbour is the main quay, 1,800 feet (548^m6) long, with a depth alongside of 23 feet (7^m0). It has one fixed 7-ton crane, and one 4½-ton mobile crane, and is connected to the general railway system.

An iron jetty, known as Schooner jetty, 325 feet (99^m0) long, with depths of from 12 to 18 feet (3^m7 to 5^m5) alongside, extends eastward from the south-eastern end of the main quay. Schooners and other small vessels, except when loading or discharging cargo, usually berth stern to this jetty with anchors out, or anchor in the Schooner basin, sometimes with sterns secured to the mooring buoys.

The heavy seas raised in the bay by strong north-easterly winds are not felt to any marked extent by vessels lying alongside the quay.

Port facilities.—There is a small repair yard, with four slipways, capable of taking craft up to 100 feet (30^m5) in length.

Minor engine repairs can be carried out in the railway workshops in the town.

From 400 to 500 tons of coal are kept in stock.

Water is laid on to the main quay.

There are two small tugs and two lighters, each of 40 tons capacity.

There is a Government hospital at Famagusta (*Lat.* 35° 07' N., *Long.* 33° 56' E.).

Fresh provisions may be obtained.

Town.—The town was in a flourishing condition under the Venetians but, after being captured by the Turks in 1571, it began to decay and was ruined by an earthquake in 1735. The Government offices are situated at Varosha (chart 2074) at the southern end of the town. The population, in 1946, was 15,912.

Deratisation.—See page 15.

Communications.—Famagusta is connected to the main railway system. There is a regular motor bus service to Larnaca.

Charts 2074, 2606.

Chart 851.

Coast.—About 3 miles northward of Famagusta is the ancient port of Salamis, now a shallow indentation, with the ruins of the town in the vicinity. The church of Ayios Barnabas (*Lat.* $35^{\circ} 10' N.$, *Long.* $33^{\circ} 53' E.$), a large white building with two domes, is situated on rising ground about a mile westward of the ruins. There is a conspicuous white hut about $1\frac{1}{2}$ miles north-eastward of Ayios Barnabas church. The coast for 4 miles northward of Salamis is low and densely wooded. The large village of Trikomo, situated nearly 2 miles inland, and about 10 miles northward of Famagusta, is visible from seaward, through the trees, from eastward and south-eastward. Between a point about 2 miles south-south-eastward of Trikomo and Boghaz, situated about 10 miles northward of Famagusta main light-structure, the coast is more open.

Chart 847, plan of Boghaz.

Boghaz.—At Boghaz, a small trading station and Port of Entry, there is a jetty, with a short wooden extension at its north-eastern end, where there is a depth of 6 feet (1^m8) where lighters can load. There is a large grain store and Customs station near the pier, and behind it an hotel. The small village of Monarga is situated about half a mile west-north-westward of the jetty; a solitary tree, elevated 141 feet (43^m0), stands close westward of the village, and is fairly easily identified from seaward.

About $5\frac{1}{2}$ cables north-eastward of Boghaz is the prominent chimney of a gypsum factory and about $1\frac{1}{2}$ cables east-north-eastward of the chimney is another small jetty; boats can go alongside the north-eastern side of this jetty, but the south-western side is foul.

A cultivated valley extends about 3 miles north-eastward from Boghaz.

Castrouli (*Lat.* $35^{\circ} 19' N.$, *Long.* $33^{\circ} 59' E.$), a small castle-shaped hill, 83 feet (25^m3) high, and covered with scrub, is situated about $1\frac{1}{2}$ miles east-north-eastward of Boghaz jetty, and immediately eastward of the hill is Gastria bay.

Anchorage.—The depths off this stretch of coast are irregular, the bottom being mainly of sand with rocky outcrops, though there is mud in places.

Good anchorage may be obtained off Boghaz, in depths of from 8 to 9 fathoms (14^m6 to 16^m5), with the storehouse bearing 292° and Castrouli, 032° ; protection from north-easterly winds is reported to be good and ships are sent to shelter here when Famagusta harbour is closed. In these conditions a better anchorage would probably be found farther eastward in Gastria bay, which, however, is open between south and east but is reported to be safe.

Charts 851, 2074.

Coast.—Cliffs, thickly wooded with scrub and small trees, extend eastward from Gastria bay to within a mile of Cape Elea, is low, but cliffs extend one mile westward from it, and foul ground extends about 2 cables offshore for $1\frac{1}{2}$ miles on either side of the cape.

Chart 2074.

Palioura point lies about $1\frac{1}{2}$ miles northward of Cape Elea (*Lat.* $35^{\circ} 19' N.$, *Long.* $34^{\circ} 04' E.$), and between it and Galounopetra point, about 29 miles north-eastward, the coast is comparatively steep-to, except off Khelones point, 21 miles north-eastward of Palioura point, where shoal water extends about a quarter of a mile offshore. See view C on chart 2074.

Charts 2074, 2606.

Chart 2074.

Mount Pamboulas rises to an elevation of 1,194 feet (363^m9), about 8 miles west-south-westward of Khelones point.

Komatou Yialou is a small trading station, about 7 miles north-eastward of Cape Elea, where there is a jetty. 5

Anchorage.—Vessels may obtain anchorage, in a depth of 20 fathoms (36^m6), off Khelones, with the storehouse, situated close to the coast, bearing 310°, allowing sufficient room to get under way with strong east-north-easterly winds. The anchorage is safe during south-westerly winds. 10

There is a Customs station at Khelones. Lighters load from a jetty, with a depth of 6 feet (1^m8) at its outer end.

Coast.—Melissakros point and Khiomi point lie about 1½ and 2 miles northward, respectively, of Khelones. An indentation in the coast, about 5½ miles north-eastward of Khelones point, is known as 15 Nankomi bay.

A black rock, just above water, lies a quarter of a mile south-south-eastward of Galounopetra point. About a mile north-north-eastward of the point and close to the rocky coast is a monastery. Anchorage may be obtained during the summer off the coast between this point 20 and Cape Andreas.

Cape Andreas (ancient *Dinaretum prom*), the north-eastern point of Cyprus, has some ruins and tombs on it. Klidhes (Khides) islet lies about a mile north-eastward of the cape, with several rocks above and below water between. See view C on chart 2074. 25

Off-lying bank.—A bank, with a depth of 40 fathoms (73^m2) over it and which has not been examined, was reported, in 1944, about 11 miles north-eastward of Cape Andreas.

Light.—A light is exhibited, at an elevation of 60 feet (18^m3), from a white steel tower, 25 feet (7^m6) in height, on Klidhes islet. 30

NORTHERN SIDE OF CYPRUS.—Coast.—Khrysokhou bay.
—**Shoals.**—Khrysokhou bay is contained between Cape Arnauti (*Lat. 35° 06' N., Long. 32° 17' E.*) (page 168), and Pomos point, about 14 miles east-north-eastward. 35

Fontana Amrosa, a small rocky bay, lies about 1½ miles south-eastward of Cape Arnauti and is a good landing place for boats.

The south-western shore of Khrysokhou bay between the cape and Latzi, 6½ miles south-eastward, is rocky and rugged. About 3 miles south-eastward of the cape and nearly half a mile offshore is 40 Kakoskaliou islet, which has some rocks near it, and affords no shelter.

Between Latzi and a point 8½ miles north-eastward, there is a low sandy beach of which the last 2 miles is fringed by a ledge of sunken rocks; thence to Pomos point, the shore is rugged and fronted by 45 rocks above and below water.

Off Latzi the depths are irregular and shoals, with depths of 29 and 20 feet (8^m8 and 6^m1) over them, lie about 10 and 9 cables north-eastward, respectively, of Latzi pierhead.

Pomos point is low and sandy and close northward there are several 50 rocks above water. Shoal water extends about half a mile north-westward from the point.

Latzi is a Port of Entry with a Custom house and a number of Government and private storehouses. There is an iron jetty, 138 feet (42^m1)

Charts 237, 2606.

Chart 2074.

long, with a depth of 5 feet (1^m5) at its head, available for small craft to load alongside.

Between October and April, northerly and north-westerly winds often render the working of cargo impossible. The anchorage is good, but there is no shelter for vessels in bad weather.

Provisions may be obtained in small quantities.

A rivulet flows into the bay 1½ miles eastward of Latzi, and on its banks, about half a mile inland, is the town of Polis.

10 About 3 miles eastward of Latzi is a small iron jetty belonging to a copper mining company; a ropeway connects the jetty with the mines. About 2 cables inland is a water tank which provides a useful landmark.

Anchorage may be obtained in summer between Kakoskaliou islet 15 (Lat. 35° 04' N., Long. 32° 20' E.) and Pomos point, in moderate depths with good holding ground.

Morphou bay.—Morphou bay is contained between Pomos point and Cape Kormakiti, about 23 miles north-eastward. Between Pomos point and Karavostasi, at the head of the bay, the shore is rocky.

20 Stavromeni point lies about 3½ miles east-north-eastward of Pomos point with Cape Kokkino about 2½ miles farther eastward; Pyrgo bay is situated about 1½ miles eastward of the cape.

Charts 847, plan of Karavostasi, 2074.

Cape Limniti, about 3½ miles east-south-eastward of Cape Kokkino 25 has, about one cable northward of it, a clifly islet, 163 feet (49^m7) high. This islet and Cape Limniti give protection from westerly winds to an anchorage, in depths of from 6 to 10 fathoms (11^m0 to 18^m3), sand and weed, situated east-south-eastward of it, in Loutros bay. Here, as at Pyrgo bay, vessels call occasionally in the summer months.

30 Native craft sometimes anchor in these bays in winter, but put to sea on the first indication of a northerly gale, when the anchorages become dangerous.

Vouni Palace hill, 835 feet (254^m5) high, on which stand the ruins of a Roman palace, lies 2 miles south-eastward of Cape Limniti, 3 cables

35 inland, and is conspicuous. The coast hereabouts, as at Cape Limniti, is clifly and fronted by boulders.

On the eastern side of the bay between Karavostasi and a point about 7½ miles north-north-eastward, the shore is low and of small stones, thence for 3 miles to a point westward of Ayia Irini (Irimi) 40 village it is sandy. From this latter point to Cape Kormakiti, about 6½ miles northward, the shore is rocky.

A shoal, with a depth of 35 feet (10^m7), lies about 8 miles north-north-eastward of Karavostasi pier.

A large sandy scar on the hills, situated about 4 miles southward 45 of Cape Kormakiti, is a prominent landmark. The Customs look-out hut, which stands about 1½ miles south-eastward of Cape Kormakiti, is also prominent from eastward, southward, and westward.

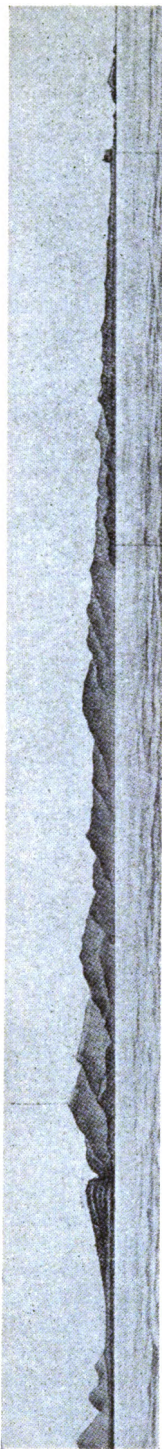
Chart 847, plan of Karavostasi.

Karavostasi.—**Buoys.**—Karavostasi (Lat. 35° 08' N., Long. 32° 50 49' E.), a Port of Entry, consists of a small group of houses near the shore. There is a Custom house with a flagstaff, and a pier, with a depth of 6 feet (1^m8) at its head, where small craft can lie. The principal exports are carobs, olives and oranges.

Several moorings for tugs and lighters lie from 3 to 4 cables north-

Chart 2606.

Mount Pamboulos.



*Cape Andreas,
bearing 308°, distant 12 miles.*

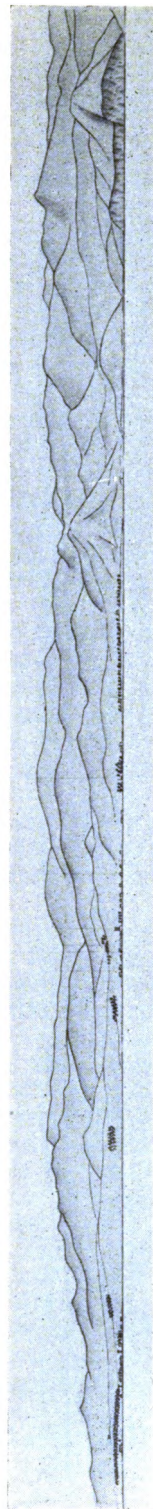
Galounopetra point.

Cape Andreas and the coast of Cyprus south-westward.
(Original dated 1850.)

*Karavostasi
Custom house.*

1,270-foot summit.

Voumi Palace hill.



*Xeropolamus
monastery.*

New Soli.

Karavostasi from north-north-westward, distant 4 miles.
(Original dated 1934.)

Buffaento.

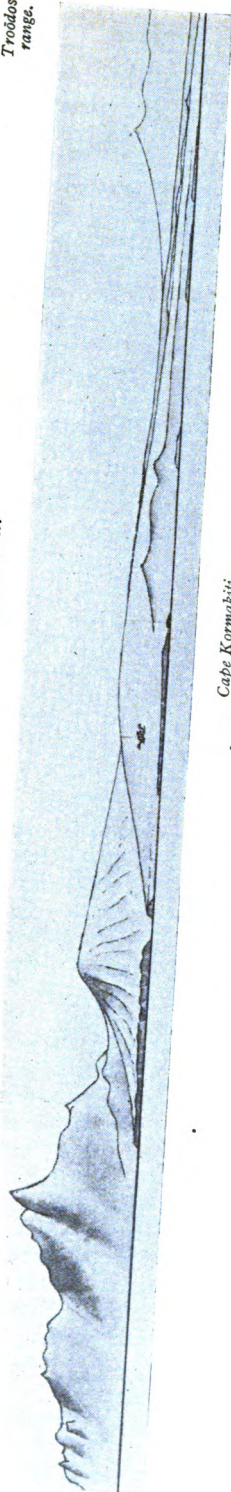
Mt. Kornos.

1,125-foot summit.

Livras.

Watch house.

*Troodos
range.*



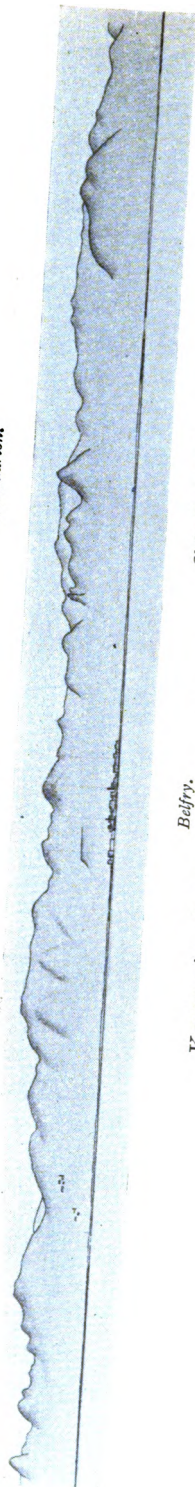
*Cape Kormakiti,
bearing 137°, distant 3½ miles.
Cape Kormakiti from north-westward.
(Original dated 1935.)*

Buffaento.

Mt. Trypa Vouno.

Kyrenia.

St. Hilarion.



*Belfry.
Kyrenia from northward, distant 3 miles.
(Original dated 1934.)*

Chart 847, plan of Karavostasi.

ward and north-eastward of the Custom House flagstaff; they are marked by small buoys. Vessels are cautioned not to anchor in this vicinity.

Chart 2074.

About $2\frac{1}{2}$ miles south-eastward of Karavostasi is the village of Lefka, situated in a valley.

Mount Troodos (ancient *Olympus*), $12\frac{1}{2}$ miles southward of Karavostasi, is 6,403 feet (1,951^m₆) high, and thickly covered with pine trees; near its summit is a military camp and an hotel.

Chart 847, plan of Karavostasi.

New Soli.—New Soli, so called after an ancient town of that name, is a village which has developed since the Cyprus Mines Corporation moved their pier and establishments from Pendaria to a position three-quarters of a mile eastward of Karavostasi. It has a post office and lies westward of the pier and several large Corporation buildings.

The Mines Corporation hospital, a long, low, white building with a red roof, lies near the coast about 2 miles north-eastward of New Soli, and near it are the remains of an old pier. Three-quarters of a mile eastward of the hospital is the Xeropotamos monastery, a large building now of little height, which may be discerned through the trees.

The pier, known as Xeros pier from the river of that name in the vicinity, is 405 feet (123^m₄) long and has a depth of 12 feet (3^m₇) at its outer end and 6 feet (1^m₈) at the boat steps on either side. The ore is loaded into lighters alongside the pier and towed out to vessels anchored, with stern secured to a mooring buoy, off the pier. Two white mooring buoys are situated about $2\frac{1}{2}$ and $3\frac{1}{2}$ cables, respectively, northward of the pierhead.

Provisions may be obtained at the canteen. About 250 tons of coal and large amounts of fuel and Diesel oil are kept in stock at New Soli.

There is a privately owned railway which connects with Nicosia via Morphou.

Light.—A light is exhibited, at an elevation of 30 feet (9^m₁), from the head of Xeros pier (*Lat.* 35° 08' N., *Long.* 32° 50' E.).

Anchorage.—**Directions.**—A good anchorage may be obtained in a depth of 12 fathoms (21^m₉), with the chimneys of the Mines Corporation pumping station bearing 158°, and Vouni palace, 277°.

The approach is clear of dangers, and the chimneys are a good mark. At night a vessel should steer for the light on the pierhead, bearing 148°, and anchor in a similar depth when at a distance of about 6 cables from it. The holding ground is excellent, being of stiff mud and sand. The shelter found at this anchorage from westerly winds is better than would be expected from the configuration of the land; even in north-westerly gales it has been found that vessels can ride safely to their anchors and the small craft ride out the winter at their moorings. Owing to the hills to the southward, the full force of the wind probably does not reach the southern part of the bay and the backwash of the seas from the coast prevents a great strain coming on a vessel's cables. This does not apply in the eastern half of the bay and is the reason why the Mines Corporation moved their pier from Pendaria to its present position.

Pilot.—A pilot is stationed at New Soli and berths vessels arriving to load ore. Pilotage is not compulsory.

Charts 2606, 2074.

Chart 2074.

Morphou.—Morphou town, which had a population of 5,455, in 1946, and from which the bay takes its name, is the largest in the district though it has no sea-borne trade. It stands on the left bank and 4 miles from the mouth of the Serakhis river, which becomes nearly lost by the time it reaches the coast about 7 miles north-eastward of Karavostasi.

Off-lying shoal.—A shoal, with a least depth of $5\frac{1}{2}$ fathoms (10^m0) over it, lies about $2\frac{1}{4}$ miles north-north-westward of the mouth of the Serakhis river, and $1\frac{1}{4}$ miles offshore.

Coast.—**Light.**—**Anchorage.**—Cape Kormakiti (ancient *Crommyon prom.*) (*Lat.* $35^\circ 24' N.$, *Long.* $32^\circ 55' E.$) is the northern extremity of a low point, rising to a small flat-topped hill about 3 miles south-eastward, from which steep and serrated ridges of hills and mountains run, parallel to the north coast of the island, eastward to Cape Andreas. A small islet, 19 feet (5^m8) high, lies close northward of the cape. Shoal water and rocky ground extend about half a mile from the cape. See view facing page 187.

A light is exhibited, at an elevation of 100 feet (30^m5), from a grey, steel framework tower, 73 feet (22^m3) in height, on the northern extremity of Cape Kormakiti.

The coast from Cape Kormakiti trends east-south-eastward for 10 miles to Vavilas point, which projects about one mile northward from the general line of the coast. Shoal water extends about half a mile north-north-westward of Vavilas point.

The bight formed on the western side of Vavilas point is known as Yeorgious bay where anchorage may be obtained, about 6 cables offshore, in a depth of about 12 fathoms (21^m9) mud.

Mount Kornos, 3,101 feet (945^m2) high, lies $2\frac{1}{4}$ miles southward of Vavilas point. See view on chart 2074.

Current.—A current of half a knot in a 300° direction was observed in the month of August in a position 5.9 miles 315° from Cape Kormakiti.

Coast.—From Vavilas point the coast trends eastward for 4 miles to Akhiropietos head, and thence to Kyrenia, 6 miles farther eastward. It is almost entirely rocky, with sunken rocks close inshore. There are depths of 6 fathoms (11^m0) half a mile offshore along this stretch of coast.

There is a small pier in a bay about 4 cables south-eastward of Vavilas point, from which carobs are shipped; a trading station is situated about $1\frac{1}{4}$ miles eastward of the point.

An islet, 10 feet (3^m0) high, lies about half a mile east-north-eastward of Akhiropietos head; shoal water extends from the coast to one cable northward of the islet.

Anchorage may be obtained, in a depth of 6 fathoms (11^m0), about 4 cables offshore, off the western side of Akhiropietos head (*Lat.* $35^\circ 21' N.$, *Long.* $33^\circ 12' E.$), over a sand and mud bottom.

The villages of Lapithos and Karavas, where provisions can be obtained, are situated about 2 miles south-westward and one mile southward, respectively, of Akhiropietos head.

Trasha island, 15 feet (4^m6) high, lies close westward of a point situated 3 miles eastward of Akhiropietos head. The island is small and not discernable at a greater distance than one mile from the coast.

Chart 2606.

Chart 2074.

A shoal, with a least depth of 32 feet (9^m8) lies about 9 cables east-north-eastward of Trasha island.

Objects which can be identified from seaward are: The Customs look-out hut, about 1½ miles south-eastward of Cape Kormakiti; Mount Kornos; the villages of Liveras and Kormakiti, about 2 and 6 miles south-eastward, respectively, of Cape Kormakiti; Orga village, near the coast, about 1½ miles north-eastward of Kormakiti village; Vasilia village, about 1½ miles south-south-eastward of Vavilas point; a white house, with a church close southward of it, in Lapithos village; a large white house on the coast, about one mile westward of Trasha island; the chimney of the Cyprus Oil Industries, 6 cables eastward of Trasha island; and St. Hilarion castle (*see* page 190).

Glykyotissa or Snake islet, 43 feet (13^m1) high, and flat-topped, lies 2 cables offshore, about 4½ miles eastward of Akhiropietos head; it is steep-to, and there are depths of 6 fathoms (11^m0) less than half a cable off its northern end. Glykyotissa church, a small white building with a rounded roof and standing alone, is easily identified, and is situated on the coast, about half a mile south-eastward of the islet and one mile westward of Kyrenia harbour.

Off-lying bank.—Ormonde bank, with a depth of 10½ fathoms (19^m2) over it, about 4 cables wide, is situated about 1½ miles north-north-westward of Cape Kormakiti.

Chart 847, plan of Kyrenia.

Kyrenia harbour.—Kyrenia harbour is an indentation in the coast protected by two moles, situated about 6 miles eastward of Akhiropietos head (*Lat.* 35° 21' N., *Long.* 33° 12' E.). There is a depth of 3 fathoms (5^m5) in the entrance, but in the centre of the harbour there is only one fathom (1^m8). *See* view facing page 187.

The harbour is only suitable for small vessels which anchor and secure astern, warping alongside the end of a jetty near the Custom house, on the western side of the harbour, to work their cargo. Another jetty, with a depth of 4 feet (1^m2) at its outer end and suitable for boats, lies in the south-eastern corner of the harbour; there are steps with less depths alongside them and care must be exercised as the bottom is of a rocky nature. The harbour affords little protection in northerly winds and during gales from this direction vessels and boats cannot lie in safety.

An islet, 12 feet (3^m4) high, lies about 2 cables westward of the head of the western mole.

Light.—A light is exhibited, at an elevation of 37 feet (11^m3), from a stone tower with a red lantern, 31 feet (9^m4) in height, at the head of the western mole. The light is difficult to distinguish at a greater distance than 4 miles, the lights of the town being seen first.

Anchorage.—**Directions.**—Good anchorage may be obtained, in a depth of 13 fathoms (23^m8), about 3 cables offshore, with the head of the western mole bearing 176°, and Glykyotissa church, 252°. At night, vessels should approach with the mole light bearing 181°, until the depths shoal to 13 fathoms (23^m8). The holding ground is good, being of mud, sand, and weed, with small boulders.

Shoals.—About half a mile eastward of the head of the western mole, a shoal with a depth of 2½ fathoms (4^m1) at its outer edge, extends about a cable offshore, and depths of 5 fathoms (9^m1) lie 2½ cables offshore.

Chart 2606.

Chart 847, plan of Kyrenia.

Kyrenia town.—Kyrenia town (*Lat.* $35^{\circ} 20' N.$, *Long.* $33^{\circ} 19' E.$), the most important on the northern coast of Cyprus, stands round its harbour and is picturesquely situated, with the wooded slopes behind
 5 it rising abruptly to the mountain range, the summit of which is Trypa Vuono, 3,065 feet (934^m2) high, with St. Hilarion castle, 2,380 feet (725^m4) high, 3 miles west-north-westward of it and Buffavento castle, 3,131 feet (954^m4) high, about $3\frac{1}{4}$ miles eastward. Other objects visible in the town are a brown minaret and the thin white
 10 spire of the Greek Orthodox church, situated about $1\frac{1}{4}$ cables southward and a cable south-south-westward, respectively, of the head of the western mole. (*See* views on chart 2074.) The massive fort, built by the Venetians and now a prison, which stands on the eastern side of the harbour with an ancient mole close northward of it, is con-
 15 spicuous. Kyrenia is a Port of Entry. It has a Government hospital and, in 1948, its population was 3,060 and that of the district about 22,800.

Provisions can be obtained, and water is laid on to the jetty.

There is regular motor car mail service with Nicosia.

20 **Climatic tables.**—*See* page 36.

Chart 2074.

Coast.—The villages of Kharzapham and Bellapais are situated about 2 miles and $2\frac{1}{2}$ miles south-eastward, respectively, of Kyrenia fort. The ruined abbey of Bellapais, from which the village takes its
 25 name, can be readily identified when the sun is shining on it.

Khoti island (*Lat.* $35^{\circ} 21' N.$, *Long.* $33^{\circ} 33' E.$), 11 feet (3^m4) high, lies 11 miles eastward of Kyrenia and $2\frac{1}{4}$ cables offshore.

Between Kyrenia and Khoti island the coast is generally rocky, with a few small sandy bays. Small off-lying rocks are numerous,
 30 but there are depths of 6 fathoms (11^m0) half a mile offshore along this stretch of coast.

The villages of Ayios Epiktitos and Platymatis, situated about $3\frac{1}{2}$ miles east-south-eastward and 9 miles eastward, respectively, of Kyrenia are easily identified. Buffavento castle (*see* above), and
 35 Mount Pentadactylos, a cluster of peaks of naked limestone like short fingers, 2,430 feet (740^m7) high, situated about 3 miles eastward of Buffavento castle, are also good landmarks. *See* view B on chart 2074.

Stazouza point, steep-to, lies 3 miles east-north-eastward of Khoti
 40 island; a rocky shoal, with a least depth of 6 feet (1^m8), lies close north-westward of the point.

A large concrete warehouse stands on the coast 2 miles westward of Stazouza point. Sygo Vouni rises to an elevation of 1,696 feet (516^m9) about $2\frac{1}{2}$ miles south-south-eastward of Stazouza point.

45 The villages of Khartya, Ayios Amvrosios, and Kalorka are situated $3\frac{1}{2}$ miles south-westward, $1\frac{1}{2}$ miles south-westward, and $1\frac{1}{2}$ miles south-eastward, respectively, of Stazouza point.

Phourni rock (*Lat.* $35^{\circ} 23' N.$, *Long.* $33^{\circ} 42' E.$), which dries, lies about $5\frac{1}{2}$ miles eastward of Stazouza point, and one cable offshore;
 50 another drying rock lies half a mile south-westward of it. The sea breaks heavily on both these rocks except in very calm weather.

Between Khoti island and Phourni rock the coast is rocky, with sunken rocks lying close offshore. There are depths of 6 fathoms (11^m0) at a distance of 4 cables from this stretch of coast.

Chart 2606.

Chart 2074.

About one mile north-eastward of Phourni rock is the trading station of Akanthou, where there is a Customs station, some store-houses, and a jetty with a depth of 8 feet (2^m4) at its head.

About 6 $\frac{1}{4}$ and 8 $\frac{3}{4}$ miles eastward, respectively, of Akanthou trading station are the trading stations of Phlamoudhi and Dhavlos (Davlos). 5

Karavopetra is a rock lying about a quarter of a mile north-westward of a point one mile eastward of Dhavlos, with a sunken rock between it and the point. Galounia, 1 $\frac{3}{4}$ miles eastward of Karavopetra, is a ledge of rocks extending about 3 cables offshore ; here also is a trading station. A reef extends about three-quarters of a mile off the coast from a point about 3 miles eastward of Galounia, and about 3 $\frac{3}{4}$ miles north-eastward of this reef is a rocky ledge, known as Kalamoulia. 10

Cape Plakoti, about 21 miles west-south-westward of Cape Andreas (page 185), is a broad projection of the coast ; half a mile eastward of it is the trading station of Yialousa. Mount Pamboulos rises to an elevation of 1,194 feet (363^m9), 4 $\frac{1}{2}$ miles south-eastward of Cape Plakoti (*Lat.* 35° 33' N., *Long.* 34° 11' E.). 15

The western entrance point of Ronnas bay lies 8 miles east-north-eastward of Cape Plakoti, and 3 $\frac{1}{2}$ miles east-north-eastward of the eastern entrance point of the bay is Lefko island, lying close offshore. 20

Erarkhas bay is situated between Lefko island and Cape Andreas, its western entrance point lying about 1 $\frac{3}{4}$ miles east-north-eastward of Lefko island.

Chart 2606.

CHAPTER VI

COASTS OF SYRIA, LEBANON, AND ISRAEL—BAY OF BASIT (BAZIT) TO EL 'ARISH

CLIMATE AND WEATHER.—See page 16 *et seq.*

Chart 2632, plan of Bay of Bazit.

BAY OF BASIT.—The Bay of Basit (Bazit) lies with its entrance between Pigeon islet (*Lat. 35° 54' N., Long. 35° 52' E.*), a low islet 5 lying close offshore, 2½ miles south-south-westward of the southern entrance point of Qasab bay, and Er Rās el Basit, 5 miles southward. About 2½ miles south-south-westward of Pigeon islet is a cliffy point, on the summit of which is the white mosque of Nabi Khudr, which is conspicuous; eastward of this point there are several rocks 10 above water within 2 cables of the shore. The ruins of ancient *Posidium* are situated about 2 miles west-south-westward of this point; an ancient mole extends a short distance eastward from the ruins, and a ledge of rocks projects about 3 cables northward.

Landmarks.—The extremity of Er Rās el Basit is low, and has 15 a flat-topped limestone hill, 165 feet (50^m3) high, directly over it; this hill and a remarkable point, one mile southward, on the summit of which is a ruined watch tower, are good marks.

Anchorage.—The best anchorage is in a depth of 8 fathoms (14^m6), sand and mud, off the ruins of *Posidium*, with the northern extremity 20 of Er Rās el Basit bearing 271°, and the head of the old mole, 236°. The depths increase rapidly outside the anchorage, there being 30 fathoms (54^m9) about 1½ miles offshore.

Current.—The current near Er Rās el Basit usually sets northward at a rate of from one to 1½ knots.

25 *Chart 2632.*

Coast.—The coast between Er Rās el Basit and Rās el Fasori, a conspicuous promontory, 11 miles southward, consists mostly of bold cliffs with a few sandy beaches, and is steep-to. Sabagli, an open roadstead, lies 3 miles southward of Er Rās el Basit (*Lat. 35° 52' N., 30 Long. 35° 47' E.*). On the northern side of Rās el Fasori is a bay with Fasori islet close to its southern shore, and about 6 cables northward of the islet is a rocky shoal, with a depth of 3 fathoms (5^m5) over it. *Chart 2188.*

Between Rās el Fasori and Rās Ibn Hani, about 6 miles south- 35 south-westward, the coast continues as bold cliffs, with some sandy

Charts 2606, 2158b, 449.

Chart 2188.

beaches, and is steep-to. The depths off Rās el Fasori are considerable, there being 180 fathoms (329^m2) less than half a mile offshore.

Rās el Bersem lies about 2½ miles southward of Rās el Fasori. The Nahr el-Arab enters the sea close eastward of Rās el Bersem. 5

About half a mile south-south-westward of Rās el Bersem is a bay, half a mile wide at its entrance, with depths of 4 fathoms (7^m3), decreasing gradually to the shore.

About a mile south-south-westward of the southern entrance point of the bay just mentioned is a rocky point, on which there is a monastery, situated between two sandy bays which are encumbered with rocks. The western bay is known as Minet el Qabban (Minat el Kaban). 10

Rās Ibn Hani is the north-western point of a low peninsula, the coasts of which have been extensively quarried; on the summit of the peninsula are the remains of a temple and some ruins. From a distance southward the cape appears as a chain of rocky islets, with the lighthouse well to seaward. 15

Anchorage.—Anchorage may be obtained in Minet el Qabban in a depth of 8 fathoms (14^m6), white sand, with Rās Ibn Hani light-house bearing 246°, and the monastery, mentioned above, 158°; here there is a good shelter, with smooth water, from the strong south-westerly summer breezes, and landing can be effected when communication with the shore at Latakia is impracticable.

Light.—A light (*Lat.* 35° 35' N., *Long.* 35° 43' E.) is exhibited, at an elevation of 46 feet (14^m0), from a white tower on Rās Ibn Hani. 25

Coast.—About half a mile south-south-eastward of Rās Ibn Hani is the northern entrance point of a bay, the southern entrance point of which is Rās el Knede, about a mile farther south-south-eastward. The bay has depths of from 1½ to 2 fathoms (2^m3 to 3^m7), but a rocky reef extends almost across the entrance. 30

Chart 2188, plan of Latakia.

Latakia.—Latakia (ancient *Laodicea*), the port of Syria, with a population, in 1946, of about 25,000, is situated on the promontory of Rās Ziyara (Ziarét), about 3½ miles south-south-eastward of Rās el Knede. 35

The upper town is separated from Marina, the lower town, which stands on the northern side of the harbour, by olive plantations and gardens.

The harbour entrance lies between two moles, on the northernmost of which, near its outer extremity, stand the ruins of a castle, named El Burj. In the south-western corner of the harbour there is an arm extending south-westward, in the entrance to which there is a mooring buoy. 40

In 1941, there were depths of from 17 to 24 feet (5^m2 to 7^m3) in the harbour. 45

Light.—Beacons.—A light is exhibited, at an elevation of 56 feet (17^m1), from a white tower, about 16 feet (4^m9) in height, in the centre of El Burj castle.

A pair of leading beacons stand at the head of the harbour about 2½ cables south-eastward of El Burj lighthouse (*Lat.* 35° 31' N., *Long.* 35° 46' E.). The front beacon consists of a framework tripod, painted red, and surmounted by a St. Andrew's cross; the rear beacon is a similar structure, painted in black and white horizontal bands, and 50

Chart 2188, plan of Latakia.

surmounted by a white ball. These two beacons in line, bearing 124° , lead between the two moles into the harbour.

Chart 2188.

- 5 **Anchorage.—Directions.**—Anchorage may be obtained, in depths of from 8 to 10 fathoms (14^m6 to 18^m3), sand, with El Burj lighthouse bearing 090° , distant from a half to one mile, but this anchorage is open and should only be used temporarily.

At a distance of about 10 miles from seaward Latakia appears as a 10 flat island. When approaching from either northward or southward a vessel should not proceed into depths of less than 11 fathoms (20^m1), until near the anchorage. See view on chart 2632.

- Vessels, with a maximum length of about 330 feet (100^m6), can enter the harbour, in fine summer weather only, one at a time, and moor, 15 heading westward, with the stern secured to the shore. Coasting vessels secure either in the south-western arm or alongside the northern quay of the harbour.

Port facilities.—Fresh provisions may be obtained. Water is available from a hose alongside the quay.

- 20 There is a Government hospital in the town.

Communications.—Latakia is connected to the general telegraph and telephone systems.

Trade.—The principal exports are tobacco, cereals and cotton; the chief imports are manufactured goods.

25 *Chart 2632.*

- Coast.**—The coast from Rās Ziyara consists of rocky cliffs, with a sandy beach, for about a mile; thence a sandy beach continues south-eastward for about 8 miles; although the depth off it is moderate, anchorage is not recommended here, as it is open to southerly and 30 south-westerly winds.

About $1\frac{1}{2}$ miles from the northern end of the beach is the mouth of En Nahr el Kebir, the largest river on the coast.

- Off-lying bank.**—Tartarus bank is a rocky patch with a least depth of 14 fathoms (25^m6) and steep-to, lying about $3\frac{1}{2}$ miles south-south-westward of Rās Ziyara (*Lat.* $35^{\circ} 31' N.$, *Long.* $35^{\circ} 45' E.$); 35 there is a confused sea in this locality during south-westerly gales. This bank, and other ledges on the coast, are frequented by sponge divers from the Grecian archipelago.

- Coast.**—Between the southern end of the sandy beach about 40 7 miles south-eastward of the mouth of the En Nahr el Kebir, and Rās Beldet el Melik (Beldi el Melek), about 9 miles southward, the coast is bordered by a line of low cliffs, within which is an extensive and partly cultivated plain, gradually rising eastward towards the high range of hills which runs parallel to the coast.

- 45 **Jebble.—Landmark.**—Jebble (Jebelli) (ancient *Gabala*), a town, built from the ruins of the ancient city and surrounded by gardens, lies close to the coast, about $5\frac{1}{2}$ miles northward of Rās Beldet el Melik. There is a small circular harbour, with two quays, where a few small vessels can berth in fine weather, but the entrance is narrow, and 50 approach is only possible from the north-westward on account of off-lying rocks. The depth in the entrance is about 24 feet (7^m3) and inside the harbour there are depths of from 17 to 20 feet (5^m2 to 6^m1).

The mosque of Sultan Ibrahim, with three domes and a minaret, stands on the northern outskirts of the town and forms a prominent 55 landmark.

Charts 2606, 2158b, 449.

Chart 2632.

Anchorage may be obtained by small vessels with local knowledge about 3 cables offshore, but it is open to westerly and south-westerly winds.

Two motor boats for towing lighters, 24 lighters with capacities of from 10 to 25 tons and 4 lighters of less than 10-ton capacity, are available.

Jebel is connected to the general telegraph system. *See* view on chart.

Coast.—Two low, rocky islets, surrounded by rocks, lie about three-quarters of a mile north-westward of Rās Beldet el Melik, and half a mile offshore. On the northern side of Rās Beldet el Melik, is the mouth of Nahr el Sin, and, on the southern bank of this river, just within the cape, are some ruins.

Between Rās Beldet el Melik and Baniyas (Banias), about 5 miles southward, there is, except for a small bight, a straight beach.

Baniyas.—Baniyas (ancient *Balanea*) is a port of call for small coasting vessels. The town lies on both banks of a river at the northern base of a volcanic hill, 930 feet (283^m5) high, on the summit of which stands a prominent fortress, known as Marqab (Markab) castle (*Lat.* 35° 09' N., *Long.* 35° 57' E.). *See* view facing page 196.

Other objects which can be easily identified are:—A minaret, close to the coast, on the north-western side of the town; a small house with a red roof, the ruins of two walls standing near a clump of trees, and a military camp, on the northern side of the town.

A rocky bank, over which the depths are very irregular, extends north-westward and northward from the coast near the minaret mentioned above; the rocks are widely scattered, and, northward of the town, the coast should be given a berth of at least one mile.

Anchorage.—Small vessels may obtain anchorage in depths of from 19 to 20 feet (5^m8 to 6^m1), sand, about 3 cables offshore, with the minaret bearing about 135°.

Landing can be effected on a shingle beach in the vicinity of the minaret.

Baniyas is connected to the general telegraph system.

Coast.—Rās el Burj, the extremity of the western spur of the hill on which stands Marqab castle, lies about 2¼ miles south-south-westward of Baniyas; a square black tower, standing at an elevation of between 50 and 60 feet (15^m2 and 18^m3), is situated about a quarter of a mile eastward of the point. *See* views facing page 196.

A short distance from the coast, with the middle of Marqab castle in line with the above-mentioned tower, a remarkable spring of fresh water rises to the surface from a depth of 18 fathoms (32^m9) with considerable force, and has the appearance of breakers; the water at the surface is brackish.

The coast from a point abreast Marqab castle (*Lat.* 35° 09' N., *Long.* 35° 57' E.) and Tartus, 16 miles southward, consists mostly of shingle beaches with off-lying rocks and shoal patches; it should not be approached within 2 miles.

Rās el Hasan (Hassan), about 10 miles southward of Marqab castle, is rocky. A low, rocky islet, named Ipsiri, lies about three-quarters of a mile south-westward of the point.

A rocky patch, with a depth of 3 fathoms (5^m5) over it, is situated 2¾ miles southward of Ipsiri islet, and is the commencement of a line of

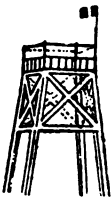
Chart 2632.

rocky patches, which, with depths of less than 5 fathoms (9^m1) over them, extends 23 miles southward, to a point abreast El Kulat, at distances of from 1½ to 2 miles offshore.

5 *Chart 1576, plan of Ruad island anchorage.*

El Mina, an ancient Phoenetian port about half a mile northward of Tartus, is a shallow basin, which affords shelter to small craft. On its eastern side stands an observatory, 65 feet (19^m8) high, and a large building of a pottery.

10

15 *El Mina observatory.*

Tartus (ancient *Antaradus*), a walled town, has on its landward side a double wall with a number of towers. A prominent minaret stands about half a mile southward of El Mina observatory, with another minaret one cable farther southward. The ruins of a cathedral, 115 feet (35^m0) in height, situated about 1½ cables south-south-eastward of the southern minaret, are also prominent from seaward.

Tartus is connected to the general telegraph and telephone systems and there is a small hospital in the town.

The coast between Tartus and the mouth of the Nahr el Arqa (Arka), 21½ miles farther southward, consists of a shingle beach, bordered by shoal water, with off-lying rocky patches.

25 **Beacons.** — Beacon "C," painted white, stands on the coast about 2 miles southward of Tartus. Beacon "B," also painted white, is situated about 5½ cables eastward of Beacon "C" (*Lat.* 34° 52' N., *Long.* 35° 53' E.).

*Tartus cathedral in ruins.*

30 **Ruad island.**—Ruad island (*Arvad* of Scripture and *Aradus* of the Greeks), 79 feet (24^m1) high, lies about 2½ miles south-south-westward of Tartus and about 1½ miles offshore. It affords, on its eastern side, the best shelter along the coast for vessels of moderate draught.

A large dismantled fort, with a minaret at its north-eastern angle, 35 crowns the middle of the island, with smaller forts at each corner. On the western side of the island are the remains of a stone wall.

Two ancient moles, constructed of huge stones, extend about half a cable from the north-eastern and south-eastern extremities of the island, respectively. The north-eastern extremity is known as *Pointe* 40 *Megarh*. About midway between the above-mentioned moles, another mole projects to form two bays, known, from north to south, as *Jeanne D'Arc* and *Cydnus* bays.

The sponges obtained here are very large and of fine quality and sponge fishing forms the chief occupation of the inhabitants.

45 **Light.**—A light (*Lat.* 34° 51' N., *Long.* 35° 51' E.) is exhibited, at an elevation of 52 feet (15^m8), from a white tower, 13 feet (4^m0) in height, standing on the fort on Ruad island.

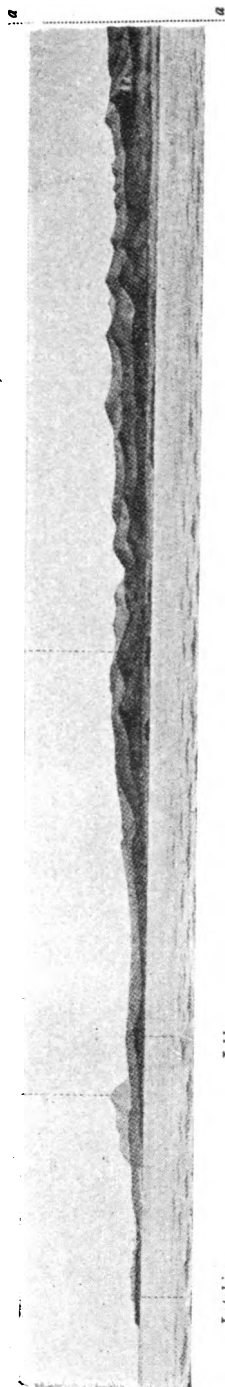
Shoals.—**Buoys.**—There are several rocky patches, with depths of from 2½ to 3½ fathoms (4^m6 to 6^m4), within 1½ miles northward of 50 Ruad island.

A red and black conical buoy, with a spherical topmark, marks *Banc Charner*, a 3-fathom (5^m5) patch, about 1½ cables northward of Ruad, and a buoy marks a submerged wreck about 1½ cables eastward of *Pointe Megarh*, the northern extremity of the island; these buoys 55 are liable to drift.

Charts 2606, 2158b, 449.

Jebel Akhira.

Ras Beldet el Mohil.

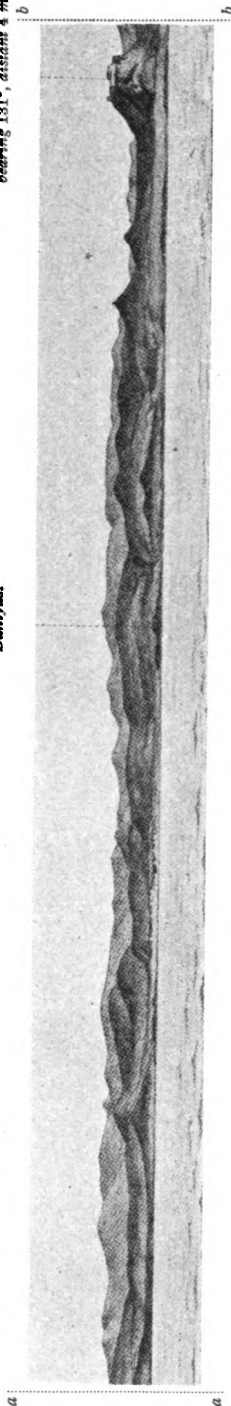


Latakia.

Jebel.

Esmiyas.

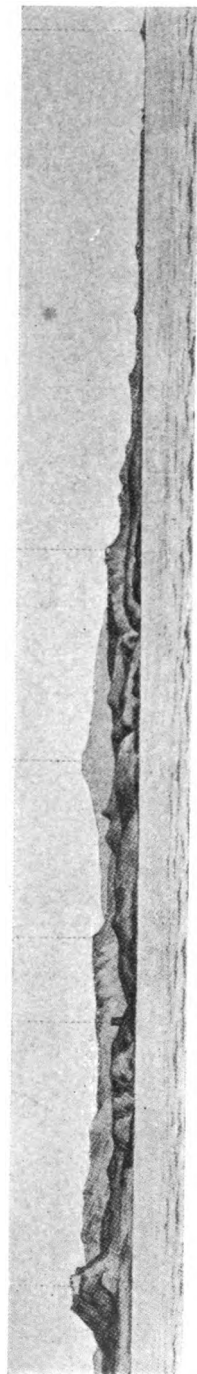
*Margab castle,
bearing 131°, distant 4 miles.*



*Margab castle,
bearing 131°,
distant
4 miles. b*

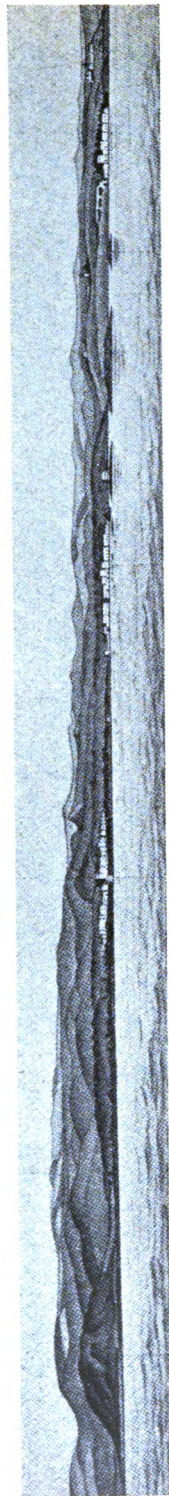
Tower.

Ruad island.



b
View, in three parts, of the coast of Syria between Latakia and Ruad island.
(Original dated 1868.)

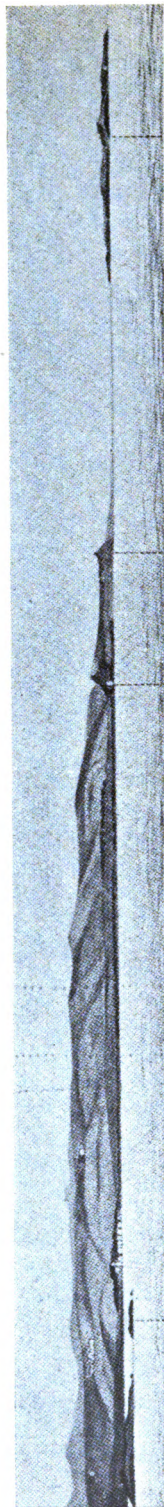
*Tower of Lions,
bearing 145°.*



Jebel Turbul.

Tripoli (Lebanon) from north-westward.

Rās esh Shiq'a.



Sanani islet.

*Square building on
Rās en Natur, bearing 201°.*

The coast south-westward of Tripoli (Lebanon) from the northern approach to the anchorage.

(Originals dated prior to 1863.)

Chart 1576, plan of Ruad island anchorage.

Anchorage.—Directions.—Anchorage may be obtained, in depths of from 5 to 6 fathoms (9^m1 to 11^m0), sand and mud, on the north-eastern side of Ruad island, with the minaret bearing 250° . Small vessels anchor near the island. 5

Vessels approaching the anchorage should pass close northward of the island, which is bold, to avoid Banc Charner, thence northward of the wreck situated $1\frac{1}{2}$ cables eastward of Pointe Megarth, thence steer east-south-eastward for the anchorage.

If the weather is clear vessels may pass northward of Banc Charner 10 by keeping the two white beacons on the mainland eastward of Ruad island, in line, bearing 095° , which leads in a depth of 5 fathoms (9^m1).

Islets and reefs.—A line of islets and rocky shoals extends for about 9 miles south-south-eastward of Ruad island, and, between them and the coast, there are several detached patches, with depths of 15 less than 3 fathoms (5^m5) over them. These islets and dangers are situated at the following distances from Ruad Island :—Banc des Tortues, with a depth of $2\frac{1}{2}$ fathoms (4^m1) over it, about 8 cables ; Banc d'El Abbas, with a depth of $2\frac{1}{2}$ fathoms (4^m6) over it, $1\frac{1}{2}$ miles ; El Abbas islet, 14 feet (4^m3) high, about 2 miles ; a rock, one foot (0^m3) 20 high, and a rock, awash, 4 and 5 cables southward, respectively, of El Abbas islet ; Abu el Faris (Abualiferis) islet, 7 feet (2^m1) high, about $3\frac{1}{2}$ miles ; El Fantias (El Fanaes) islet, 7 feet (2^m1) high, with Maqrud (Makrud) islet close southward of it, about $4\frac{1}{2}$ miles.

Caution.—As the seaward side of the above dangers is fairly steep- 25 to, a vessel should not approach within depths of less than 14 fathoms.

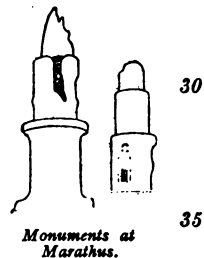
Coast. — Beacon. — On the mainland, about $2\frac{1}{2}$ miles south-eastward of Ruad island, are two monuments, 17 feet (5^m1) in height. The higher, consists of a large cylindrical block on a square pedestal, surmounted by a cone-shaped stone, and stands at an elevation of 105 feet (32^m0) ; the other consists of two blocks, the upper of which has a domed top. In the vicinity are the ruins of a large city, probably the ancient *Marathus*.

Beacon "A" (*Lat. $34^\circ 50'$ N., Long. $35^\circ 53'$ E.*), consisting of a black and white pyramid, stands on the coast, about half a mile westward of the two monuments described above. This beacon in line with the higher of the two monuments, bearing 094° , leads between Banc des Tortues and Banc d'El Abbas, 40 in a least depth of $4\frac{1}{2}$ fathoms (8^m2).

Chart 2633.

At Marathus the hills recede inland, leaving a large cultivated plain studded with tumuli, on most of which are villages, between them and the sea. Hammam (Haman) village is situated on the coast, $5\frac{1}{2}$ miles 45 southward of Marathus. Five rivers intersect the plain, winding westward through the opening in the mountains between Hammam and Jebel Akkar, 6,980 feet ($2,127^m5$) high, the northern peak of the Lebanon range, situated 28 miles south-south-eastward of Marathus. En Nahr el Kebir (ancient *Eleutherus*), the largest of the rivers, 50 flows into the sea $12\frac{1}{2}$ miles southward of Marathus ; Sheikh Jabir (Sheik Jabber), on the northern side of its entrance, is a tomb.

Off-lying shoals.—A shoal, with a depth of 2 fathoms (3^m7), lies about $2\frac{1}{2}$ miles south-westward of Hammam ; it is a continuation of



Monuments at
Marathus.

Charts 2633, 2606, 2158b, 449.

Chart 2633.

the line of reefs extending south-south-eastward from Ruad island. About a mile north-westward of this shoal is a $4\frac{1}{2}$ -fathom (8^m7) patch, lying about $2\frac{1}{4}$ miles offshore; about $1\frac{1}{4}$ miles southward of the same shoal is a 4-fathom (7^m3) patch, and $3\frac{1}{4}$ miles southward another 4-fathom (7^m3) patch.

Caution.—The coast should not be approached in this vicinity within $2\frac{1}{4}$ miles, nor into a depth of less than 20 fathoms (36^m0).

Coast. — Lights. — Prohibited area. — Light-buoy. — El Kulat, about 4 miles south-south-eastward of Sheikh Jabir, and $1\frac{1}{2}$ miles inland, is a large and conspicuous ruin standing on the summit of a tumulus, and attains an elevation of 142 feet (43^m3).

Chart 1576, plan of Tripoli roadstead.

Qal'at Hakmun (Kalat Hakmone) (ancient *Orthosia*) consists of two mounds, covered with ruins, lying at the mouth of En Nahr el Barid, $7\frac{1}{2}$ miles south-south-westward of Sheik Jabir; at this point the high land once more approaches the coast.

Rās el Lados (*Lat. $34^{\circ} 28' N.$, Long. $35^{\circ} 53' E.$*), a rocky bluff, 72 feet (21^m9) high, lies $3\frac{1}{4}$ miles south-westward of Qal'at Hakmun, and is the termination of one of the spurs of Jebel Turbul, a round-topped mountain, 2,314 feet (705^m3) high, with a village on its eastern shoulder; this mountain is a good landmark.

In 1935, foul ground was reported to exist about 3 cables north-north-westward of Rās el Lados.

Lights are exhibited from two radio masts, standing near the coast, about one mile south-westward of Rās el Lados.

Pipe-lines, indicated by pecked lines on the chart, extend north-westward from the coast at a point about three-quarters of a mile westward of Ras el Lados. There are mooring buoys at the seaward end of each pipe-line; a signal station with a flagstaff is situated near the landing place of the pipe-lines.

Anchorage in, and passage through, the area, indicated by pecked lines on the chart, in the vicinity of the above-mentioned pipe-lines, are prohibited.

A light buoy, exhibiting a *white flashing light every ten seconds*, is moored about 2 miles north-westward of Rās el Lados, and marks the north-western corner of this prohibited area.

Tripoli.—Tripoli, known to the Arabs as Tarabulus, and situated on both banks of the Nahr Abu 'Ali, or Kadisha river, about one mile within its mouth, is a well-built town surrounded by luxuriant gardens. The Nahr Abu 'Ali flows into the sea about $2\frac{1}{4}$ miles westward of Rās el Lados (*Lat. $34^{\circ} 28' N.$, Long. $35^{\circ} 53' E.$*). The population, in 1948, was 70,800.

A large and conspicuous castle, named Château de Raymond, stands on a hill, 197 feet (60^m0) high, in the southern part of the town, but it is fast falling into ruins. The town of El Mina is built on the low promontory, which terminates in the north-western point of the coast, about $1\frac{1}{4}$ miles north-westward of Tripoli.

Along the coast westward of the mouth of the Nahr Abu 'Ali is a line of square towers. The eastern one, at the mouth of the river, is scarcely visible from seaward, being obscured by trees; the next one to the westward, known as the Tower of Lions, is 68 feet (20^m7) in height, and conspicuous from the approach to the anchorage. See view facing page 197.

Charts 2633, 2606, 2158b, 449.

Chart 1576, plan of Tripoli roadstead.

Islets and dangers.—Breakwater.—A chain of islets and low rocks extends $3\frac{1}{2}$ miles north-westward of El Mina ; of these El Bellan (Bellene) islet, 19 feet (5^m8) high, lying about 6 cables from El Mina, is the highest ; at the outer end of the chain is Ramkin (Ramkine) 5 (*Lat. 34° 30' N., Long. 35° 45' E.*), with En Nakhle (Nakhel) and Sanani inside it.

A breakwater extends about half a mile east-north-eastward from El Bahar, an islet lying $1\frac{1}{2}$ cables north-westward of El Mina.

Sanani channel.—Sanani channel lies between Sanani islet and 10 the shoal extending nearly 2 miles north-westward from El Mina ; it has a least width of about $3\frac{1}{2}$ cables, and a least depth of $6\frac{1}{2}$ fathoms (11^m9) in the fairway, but, as it is unmarked, it should only be used by a vessel with local knowledge.

Lights.—A light is exhibited, at an elevation of 65 feet (19^m8), 15 from a white tower, about 16 feet (4^m9) in height, on Ramkin islet.

A light is exhibited, at an elevation of 39 feet (11^m9), from a white tower, 20 feet (6^m1) in height, situated on the head of the breakwater.

A light is occasionally exhibited from the Tower of Lions. 20

Anchorage.—Directions.—Anchorage may be obtained in Tripoli road, in a depth of 7 fathoms (12^m8), about one mile northward of El Mina Breakwater light-tower. Approach to this anchorage may be made with the Tower of Lions bearing 156°, open south-westward of the Château de Raymond or with the Tower of Lions in line with the 25 hospital, bearing 163°.

A vessel approaching Tripoli from the southward should steer to pass not less than half a mile westward of Ramkin Islet lighthouse, thence she should steer north-eastward until this lighthouse bears 180°, thence eastward until the Tower of Lions is in line with the 30 Château de Raymond, bearing 145°, thence steer for the anchorage.

In north-easterly gales anchorage may be obtained south-westward of El Mina, in a depth of 10 fathoms (18^m3), with the Château de Raymond bearing 095°, and the western extremity of El Bellan islet bearing 005°. 35

There are some mooring buoys in the harbour. Sailing vessels anchor off the quays, securing their sterns to chains on the quays.

There are some bollards on the detached breakwater, but none on the quays.

At night, a vessel should not approach into a depth of less than 40 20 fathoms (36^m6) when rounding Ramkin islet (*Lat. 34° 30' N., Long. 35° 45' E.*) ; when Ramkin Islet lighthouse bears 180°, distant about three-quarters of a mile, she should steer 090° until the light bears 254°, then steer 163° and anchor in a depth of 7 fathoms (12^m8) with El Mina Breakwater light bearing 192° and Ramkin Islet light 45 bearing 298°.

A pipe-line, indicated by a pecked line on the chart, extends about $2\frac{1}{2}$ cables northward from the coast at a point about one mile eastward of El Mina promontory.

Regulations.—There is an area reserved for the use of hydroplanes 50 situated southward of the breakwater. A vessel anchored in this area must leave within half an hour when requested to do so by the Harbour Authorities.

It is forbidden to navigate by day when a red pendant is hoisted,

Chart 1576, plan of Tripoli roadstead.

and at night when three *red* lights, vertically disposed, are exhibited from the mast on the roof of the Captain of the Port's office; these signals are accompanied by a blast of one minute's duration on the
 5 siren. A vessel must leave as soon as possible, by the shortest route, on these signals being made, and at night, must show a *red* light, visible at least 2 miles, which may be seen from overhead as well as all round the horizon.

Fishing is prohibited at all times.

- 10 It is prohibited to throw overboard any floating object in the area comprised between the line of the islets off El Mina to the Sanani channel, and a line drawn in a 000° direction through Rās el Lados, and as far north as the parallel of 34° 29' N.

Landing places.—Boats should land at the Custom House mole, 15 marked "Boat jetty" on the chart, about 7 cables westward of the Tower of Lions (*Lat.* 34° 27' N., *Long.* 35° 49' E.).

There is good landing for boats on the sand beach on the south-western side of El Mina promontory, southward of the ancient wall, during strong north-easterly winds.

- 20 **Inner harbour.**—The inner harbour, with depths in it of from 3 to 5 feet (1^m0 to 1^m5), situated near the Railway station, about 1½ cables west-south-westward of the Tower of Lions, affords shelter to lighters and small craft in all weathers. Entrance to this harbour is difficult on a dark night.

- 25 **Pier.**—Close westward of the Inner harbour is the Railway pier about 325 feet (99^m1) long, and 39 feet (12^m0) in width, with a depth of 9 feet (2^m7) at its head, shoaling to 3 feet (1^m0) at its inner end. With winds between east and north-west, berthing at this pier, and elsewhere in the vicinity, is difficult and often impracticable.

- 30 **Port facilities.**—About 1,000 tons of coal are kept in stock, but no fuel oil. Supplies of petrol can be obtained.

Tugs and lighters are available.

Minor repairs can be undertaken.

- 35 There are two steam cranes, on the Railway pier, with capacities of 3 and 1½ tons, respectively.

Provisions are plentiful. Water can be obtained from the Railway Company's reservoirs on application by telephone to the Company's Offices at Beirut.

Consul.—A British Consular officer resides at Tripoli.

- 40 **Communications.**—Tripoli is connected to the general railway, telegraph, and telephone systems of Syria, and with Beirut by motor transport, whence regular steamer communication may be obtained. See page 207. There is regular communication by air with France.

Deratisation.—See page 15.

- 45 **Trade.**—The principal exports are lemons, liquorice, and eggs; the chief imports are benzine and petroleum.

- Coast.**—The coast for 2½ miles southward of El Mina (*Lat.* 34° 27' N., *Long.* 35° 48' E.) is mostly a sandy beach, partly bordered by rocks, thence for 1½ miles south-westward it is rocky, and rises to Mar Ya'qub, 50 945 feet (288^m0) high, on which there is a monastery.

A rocky patch, with a least depth of 13 feet (4^m0) over it, lies about 1½ miles north-westward of the monastery and three-quarters of a mile offshore; there are other patches with depths of 2½ and 3 fathoms (4^m6 and 5^m5) over them inshore of it.

Charts 2633, 2606, 2158b, 449.

Chart 2633.

En Rās Natur, on which there is a large square building, lies 6 miles south-westward of El Mina. One mile farther south-westward is Burj Enfe (Enfeh), a ruin, situated on a rocky islet close off a projecting point; on the southern side of this point is Enfe village. A ridge of rocks was reported, in 1937, to extend one mile from this point. 5

Il Huri (Hereh) bay is entered between En Rās Natur and Rās esh Shiq'a (Shuka), $4\frac{1}{2}$ miles south-westward; the northern part of the bay near Enfe village is rocky. 10

Near Enfe village a copious freshwater spring bubbles up from a depth of 14 fathoms (25^m6) and, mixing with the salt water, causes a smooth oily appearance. Sometimes there is a strong ripple and it may look like a shoal.

Shiq'a (Sheka) village lies about $1\frac{1}{2}$ miles south-south-eastward of 15 Enfe village. Its main importance lies in its cement works which can produce about 100,000 tons annually. The light from the works can usually be seen at night.

Deratisation.—Deratisation of small vessels is carried out at Shi'qa (*Lat. $34^{\circ} 20' N.$, Long. $35^{\circ} 44' E.$*). See page 15. 20

Coast.—Rās esh Shiq'a or Cape Madona (ancient *Theuprosopron*) is a projecting tableland, 618 feet (188^m4) high, with a chapel on its north-western edge; its sides are precipitous and wooded, with several white patches on its northern face. See view on chart 2633.

Anchorage.—Anchorage may be obtained with Burj Enfe bearing $25^{\circ} 02'$, in a depth of 9 fathoms (16^m5), white sand, sheltered from the strong south-westerly summer breezes, in the southern part of Il Huri bay, off Mar Saman monastery, which stands, amidst thick foliage, on the side of the cliff.

Lebanon range.—The Lebanon range, or Jebel Libnan, trends 30 70 miles south-south-westward from Jebel Akkar (page 197). Southward of this peak the range falls, but 6 miles south-westward of it, it rises again in a high bluff shoulder, $4\frac{1}{2}$ miles south-westward of which is Dahr el Qadib (Dhor el Khodib), 10,061 feet ($3,066^m6$) high, the highest peak of the range. The other principal peaks are Jebel 35 el Makmal (Mâkmal), 9,996 feet ($3,046^m8$), $2\frac{1}{2}$ miles southward of Dahr el Qadib; Jebel Sannin (Sunnin), 8,162 feet ($2,488^m8$), 18 miles eastward of Beirut; Jebel Kenisa (Keneiseh), 6,666 feet ($2,031^m8$), 8 miles south-westward of Jebel Sannin; and Tomat Niha with a double peak, 5,620 feet ($1,713^m0$) high, 13 miles eastward of Sidon. 40 These peaks are visible from seaward.

The Cedars of Lebanon are a group of trees standing at an elevation of 6,700 feet ($2,042^m2$) on the western slope of the range westward of Jebel el Makmal, and are visible from seaward in the vicinity of Rās esh Shiq'a. The source of Nahr Abu 'Ali is in the gorge southward 45 of the cedars.

Coast.—Caution.—The coast for about three-quarters of a mile southward of Rās esh Shiq'a (*Lat. $34^{\circ} 19' N.$, Long. $35^{\circ} 40' E.$*) is bordered by rocky ledges and should not be approached within a distance of one mile. 50

Rās Sel'ata, which is steep-to, and on which stands a tower, is situated about $2\frac{1}{2}$ miles south-westward of Rās esh Shiq'a. Between Rās Sel'ata and Rās Ma'ameltein (Mâmeltein), $15\frac{1}{2}$ miles southward, the coast has a barren aspect, and consists of rocky points, the ends

Chart 2633.

of the high rugged spurs of the Lebanon range, interspersed with small sandy bays.

Batrun (ancient *Botris*), a small village, lies one mile southward of Rās Sel'ata; the remains of the ancient port are still visible. Vessels occasionally anchor off Batrun, in a depth of 10 fathoms (18^m3), sand.

Jubeil (Jebeil) (ancient *Byblus*), situated 8½ miles southward of Batrun, is a walled and trenched village, with towers at intervals on the walls, situated at the base of a spur of the Lebanon range. A high square tower stands in the middle of the village. The ancient port is nearly filled with sand and stones, but still affords shelter to small coasting vessels. The landing place is in a small cove northward of the village.

The Nahr Ibrahim, a considerable river, which rises in the high mountains of El Aqura (Akúra) and Afqa (Afka), enters the sea about 3½ miles southward of Jubeil. The road from Beirut to Tripoli crosses a bridge which spans the river about a quarter of a mile from the sea.

Between Rās Burbara (*Lat.* 34° 12' N., *Long.* 35° 37' E.), situated about 5½ miles southward of Rās Sel'ata, and Rās Ma'ameltein, depths of more than 100 fathoms (182^m9) are found, in places, at half a mile from the coast.

Chart 2633, plan of Junch bay.

Juniye bay.—Juniye (Junch) bay, the port of the northern portion of the Lebanon, is contained between Rās Ma'ameltein and Rās et Tair (Tir), a low and shingly point, situated 1½ miles south-south-westward.

There are considerable depths in the northern and central parts of the bay, but shoal water with rocky ground extends about 2½ cables from the south-eastern and southern shores.

A square ruin stands near the south-eastern extremity of Rās Ma'ameltein, on the western side of a small cove. An English hospital is situated on the eastern side of this cove, about 3 cables east-south-eastward of the square ruin.

The two monasteries of El Ghazir and St. Antonio, respectively, stand on a precipitous spur of a mountain, 1,161 feet (353^m9) high, which nearly reaches the north-eastern shore of the bay, and form a prominent landmark. The statue of Notre Dame de Liban, which stands on a hill, 2,018 feet (615^m1) high, about 1½ miles eastward of Rās et Tair, is also prominent.

Anchorage may be obtained in summer, in a depth of 4½ fathoms (8^m2), sand, with Rās et Tair bearing 245°, and the Custom house, situated about three-quarters of a mile eastward of Rās et Tair, bearing 153°. Large vessels may obtain anchorage in a depth of 8 fathoms (14^m6), sand, with Rās et Tair bearing about 227° and the Custom house 153°.

The beach fronting the village affords good landing.

Chart 1563.

Rās el Kelb lies 2½ miles south-south-westward of Rās et Tair. The Nahr el Kelb, which, with the exception of the Nahr Abu' Ali (page 201) is the largest river on this coast, enters the sea about 4 cables north-eastward of Rās el Kelb. Northward of the river, and about one mile inland, there are several monasteries standing on conical wooded hills. On the southern side of the river, about 4½ cables eastward of Rās el Kelb, the former monastery of Mar Yusef el Burj (*Lat.*

Charts 2606, 2158b, 449.

Chart 1563.

33° 57' N., Long. 35° 36' E.), now a barracks, stands on a rocky peak, at an elevation of 524 feet (159^m7). There is very little water on the bar of the Nahr el Kelb during the summer.

Anchorage may be obtained in the summer, in depths of from 7 to 9 fathoms (12^m8 to 16^m5), mud and sand, with the water-mill, on the northern side of the entrance to the Nahr el Kelb, bearing about 124°.

Jun el Khudr.—Jun el Khudr, or Baie St. Georges, the shore of which is entirely sand, lies between Rās el Kelb and the mouth of the Nahr Beirut, situated about 4 miles south-westward; several streams flow into the bay. About 2½ miles southward of Rās el Kelb, at Antelias, the large Armenian church of St. Gregory forms a conspicuous landmark.

The following other objects are prominent and easily identified:— Two soap factories, each with a chimney, situated about half a mile and one mile south-south-westward, respectively, of the church of St. Gregory; the asylum of St. Francis, surmounted by a large crucifix, one mile southward of the church of St. Gregory. Between the asylum of St. Francis and the Nahr Beirut there are several other factory chimneys, the positions of which are indicated on the chart.

The Nahr Beirut, a small stream in summer, is crossed by a bridge about 4 cables from its entrance.

Prohibited anchorage.—Buoys.—A pier, with a depth of 12 feet (3^m7) at its head, extends north-north-westward from the southern shore of Jun el Khudr at a point about one mile east-south-eastward of the Nahr Beirut mouth and from it two pipe-lines run north-north-westward for a distance of about 3½ cables; the outer ends are marked by two small white conical buoys, near which there are three white mooring buoys to which tankers secure.

A pier, with a depth of 10 feet (3^m0) at its head, extends northward from the eastern entrance point of the Nahr Beirut, and from its head two pipe lines run northward for a distance of about 1½ cables, the outer ends being marked by a small red conical buoy. There is a similar buoy on the eastern side of the pipe-lines and at their outer ends there are two red mooring buoys, to which tankers secure their sterns, with anchors out to the northward. There is a flagstaff at the root of the pier.

A sandbank off the mouth of the Nahr Beirut dries out as far as Nebr Abou Saleh (*Lat.* 33° 54' N., *Long.* 35° 32' E.), an islet 19 feet high, situated about one cable north-westward of the root of the pier. Another islet, known as Zier Tem Nahr, 22 feet high, lies half a cable northward of Nebr Abou Saleh; a small rock, named Le Mirmillon, which dries 2 feet (0^m6), is situated about three-quarters of a cable north-north-westward of Zier Tem Nahr.

Vessels are prohibited from anchoring within a distance of about 330 yards (301^m7) of the mooring buoys, or within about 165 yards (150^m9) of any part of the pipe-lines.

Coast.—Between the western entrance point of the Nahr Beirut and Rās Beirut, 3½ miles westward, there is a succession of small bays and rocky points. Quarantine point lies about half a mile westward of the western entrance point of the Nahr Beirut, and from it a line of rocks, above and below water, the outer of which is named Sheishi, extends about a quarter of a mile north-eastward. A pillar, 23 feet

Charts 2606, 2158b, 449.

Chart 1563.

(7^m0) high, stands on Sheishi, from which depths of 3 fathoms (5^m5) or less extend about one cable northward. See view facing page 210.

- 5 **BEIRUT.—General remarks.**—Beirut (ancient *Berytus*) is the most flourishing seaport of Lebanon, and the seat of Government. In 1948, there was an estimated population of 234,000.

The town is situated within the coast between Quarantine point and Rās Beirut; an old wall encloses its more ancient part, in which are
10 the bazaars. The extensive suburbs are built on the slope of a terraced hill, and consist of numerous picturesque villas surrounded by gardens. Beyond these the mulberry groves cover the whole acclivity, extending a considerable distance on either side.

Chart 2633.

- 15 The land eastward of the town rises rapidly to an elevation of 2,733 feet (833^m0), about 8½ miles from Rās Beirut (*Lat.* 33° 54' N., *Long.* 35° 28' E.); on the summit here stands the village of Mar Sha'ya (Ishāya) and, on the range south-westward, are the villages of Brummana (Brumāna) and Beit Meri. Farther inland are the high
20 peaks of the Lebanon range (page 201) of which Jebel Sannin is visible at a distance of from 40 to 50 miles from seaward.

The land southward and westward of the town rises in remarkable red hills, about 300 feet (91^m4) high, of drifting sand, which, being blown by the strong south-westerly breezes in summer, is encroaching
25 on the town. These hills are prominent from seaward.

Chart 1563.

- Landmarks.**—The following objects are conspicuous and easily identified :—A water tower, standing at an elevation of 407 feet (124^m0), about 9 cables south-south-westward of Quarantine point; the signal
30 tower, surmounted by a tall mast, standing near the coast, at an elevation of 390 feet (118^m9), about 2½ miles westward of the water tower, and the square clock tower of the principal building of the American college, situated half a mile north-north-eastward of the clock tower.

- 35 Other prominent objects are :—The Hotel St. Georges, a large building with a remarkable roof, situated on Rās Minat el Hosn, about half a mile east-north-eastward of the clock tower; the Armenian church of Beirut, with a high conical tower, standing about one mile east-south-eastward of the clock tower; a yellow minaret, situated
40 1½ miles eastward of the clock tower, which should not be mistaken for Medjedieh mosque, about 1½ cables north-westward of it, and which is not now visible. There are numerous other towers and minarets, the more important of which are indicated on the chart.

- Lights.**—A light (*Lat.* 33° 54' N., *Long.* 35° 28' E.) is exhibited, at
45 an elevation of 206 feet (62^m8), from a tower, painted in black and white bands, about 89 feet (27^m1) in height, situated about 2 cables south-eastward of the extremity of Rās Beirut.

- A light is exhibited, at an elevation of 49 feet (14^m9), from a white tower, 23 feet (7^m0) in height, on the head of the small arm extending
50 200 feet (61^m0) southward from a point about half-way along the northern mole; this light was reported, in 1934, to be difficult to distinguish from the lights of the town.

Lights are exhibited on the heads of the northern and eastern moles.

Charts 2606, 2158b, 449.

Chart 1563, plan of Beirut harbour.

Harbour.—Beacon.—The harbour is situated within two moles. The northern mole extends about 7 cables east-north-eastward from Rās esh Shamiye, and a short arm projects southward at right angles from it, about half-way along its length. The eastern mole extends northward for nearly 2 cables from a wharf, on reclaimed land, southward of the eastern extremity of the northern mole. The eastern mole is the oiling berth for heavy fuel and is also used for coaling, as an alternative to the coaling wharf, situated close westward of its root ; it has a least depth of 5 fathoms (9^m1) on each side, except for the southern 250 feet (76^m2) on the eastern side, where the least depth is 4 fathoms (7^m3). A ledge, usually awash, projects about 10 feet (3^m0) from the southern end of the western side of the eastern mole ; its northern end is marked by a beacon, 8 feet (2^m4) in height and surmounted by a white disc ; vessels berthing in the vicinity should exercise caution.

The harbour is divided into the outer and inner harbours by a wide central mole, with quays on its three sides, which extends northward from a position on the southern side about 1½ cables westward of the root of the eastern mole (*Lat.* 33° 54' N., *Long.* 35° 31' E.).

The entrance to the harbour is about 800 feet (243^m8) wide and has a depth of 8 fathoms (14^m6), which shoals gradually to 4 fathoms (7^m3) at the outer harbour quays and from one to 3 fathoms (1^m8 to 5^m5) at the inner harbour quays.

Vessels about 590 feet (179^m8) in length and of 32 feet (9^m8) draught can enter the harbour and secure to buoys close to and parallel with the northern mole. Smaller vessels can moor on the southern side of the inner harbour heading northward with an anchor out ahead and their sterns secured to mooring buoys, or they may berth at one of the quays of the central mole or outer harbour, as their length and draught permit ; the northern quay of the central mole has a least depth of 25 feet (7^m6) alongside. Trading schooners berth at the schooner quay on the southern side of the inner harbour, or, when not working cargo, at the central part of the northern mole, usually stern-to with anchors out ahead or head to a buoy. Close southward of the northern mole, between the projecting arm and the root, are barge moorings ; barges are secured with their heads to these buoys and their sterns to the mole. The eastern mole and all quays are connected to the general railway system.

The Custom house, Captain of the Port's office and Health office are situated in the south-eastern corner of the inner harbour.

Mooring buoys.—There are numerous mooring buoys in the harbour and also in Minat el Madawar, or Baie St. André, between the eastern mole and Quarantine point (*Lat.* 33° 54' N., *Long.* 35° 32' E.) ; the positions of these buoys may best be seen on the chart.

On the eastern side of Minat el Madawar, at Mourgue d'Algue, about a quarter of a mile south-westward of Quarantine point, there is a tanker berth with bollards and a mooring buoy.

Pilots.—Regulations.—Pilotage is compulsory for all vessels of over 100 tons. Pilots board vessels about a quarter of a mile outside the entrance to the harbour.

Vessels are not permitted to enter the harbour at night, but those in the harbour may proceed to sea with permission of the Captain of the Port. Vessels leaving the harbour have priority of those entering.

Chart 1563.

Anchorage.—The best anchorage is off the town, in depths of from 11 to 13 fathoms (20^m1 to 23^m8), with the lighthouse on the southern arm of the northern mole bearing 227°. The greater-part of the anchorage is rocky, covered by sand or mud. In winter, during rough weather, in order to avoid the heavy ground swell, the best anchorage is in a depth of 36 fathoms (65^m8) with the lighthouse on the southern arm of the northern mole bearing 170°, distant three-quarters of a mile. The anchorage is open from west to north, and between November and March, if the strong south-westerly gales shift to northward of west in the squalls, vessels should be prepared to weigh and either proceed to sea or to Jun el Khudr, as the gale will probably shift to the north-westward. Jun el Khudr is the usual winter anchorage for men-of-war. Small vessels and schooners sometimes anchor in Minat el Medawar.

Vessels lie in Jun el Khudr during winter in a depth of about 10 fathoms (18^m3), with Sheishi rock off Quarantine point (*Lat.* 33° 54' N., *Long.* 35° 32' E.), bearing 261°, in comparative safety, with little strain on the cables, owing to a strong offset during north-westerly and northerly gales, but a very heavy sea rolls in with these winds, and breaks in a depth of less than 5 fathoms (9^m1). The bottom is stiff mud, in which the anchor soon becomes buried. It is reported that during north-westerly gales there is sometimes a westerly current, causing vessels at anchor to lie with heads to the north-eastward.

Prohibited anchorage.—Anchoring and fishing are prohibited, due to the existence of submarine cables, in an area, indicated by pecked lines on the chart, extending about 8 cables northward from the coast between the root of the northern mole at Beirut and Rās Minat el Hosn, about 4½ cables westward. See page 13.

Directions.—A vessel approaching Beirut from the southward should not round Rās Beirut (*Lat.* 33° 54' N., *Long.* 35° 28' E.) at a distance of not less than half a mile, as a rocky ledge extends 1½ cables westward of Rās el-Ghara, about half a mile southward of it, and a strong current usually sets northward.

After rounding the cape a vessel should anchor eastward of the prohibited anchorage, to avoid a deep hole, with depths of over 100 fathoms (182^m9), westward of it, which approaches to a distance of 2½ cables of the coast.

Port facilities.—Minor repairs can be undertaken. There is a patent slip which can take vessels up to 400 tons.

From 1,000 to 1,500 tons of coal, and from 2,000 to 2,500 tons of fuel oils of all kinds are kept in stock. Diesel oil is supplied to vessels from lighters. Heavy fuel oil is supplied at the eastern mole.

There are floating cranes of 50, 30, 12, and 5 tons lifting capacity, and travelling cranes of 3 tons capacity on the south quay of the outer harbour, and on the schooner quay of the inner harbour. In addition there are floating sheerlegs of 25 and 10 tons capacity, respectively, and one 4-ton hand sheerlegs.

Four tugs and 105 lighters, with a total capacity of about 3,500 tons, are available.

Fresh provisions are plentiful. Fresh water is laid on to the quays and there are two water-boats, the larger having a capacity of 120 tons.

Several hospitals are situated in the town.

Charts 2633, 2606, 2158b, 449.

Chart 1563.

Communications.—Beirut is connected to the railway systems of Lebanon, Syria and Israel and to the general telegraph and telephone systems.

There is regular steamer communication with ports in Israel, Alexandria, Cyprus, Rhodes, Istanbul, Piræus, Naples, Genoa, and Marseilles; there is occasional communication with Great Britain.

There are regular and frequent air services to Egypt, Cyprus, Europe, Syria, Persia and Israel.

Radio station.—There is a radio station at Beirut. *See* page 15. 10

Quarantine.—A vessel must not communicate with the shore until she has obtained pratique.

Deratisation.—*See* page 15.

Legation.—Consulate.—There is a British Minister at Beirut, as well as a British Consular Officer. 15

Climatic tables.—*See* page 38.

Trade.—The principal exports are silk, wool, olive oil, lemons, oranges, carpets and skins; the chief imports are cotton and woollen goods, metals, rice, sugar, petroleum, coal, coffee, flour, hardware, paper, preserved goods, timber, and iron bars. 20

Chart 2633.

COAST.—The coast from Rās Beirut (*Lat.* 33° 54' N., *Long.* 35° 28' E.) to Rās Damur, about 13 miles southward, consists of a sandy beach which fronts a well cultivated rich plain with olive groves, extending to the foot of the hills which rise steeply. There are numerous villages and monasteries situated on the hill sides amidst vineyards and mulberry groves. Within Rās Damur is a remarkable mountain and valley which divides the high land running parallel to the coast. 25

The white minaret of Nabi el Ouzaai mosque and Khalde radio mast, about 3 and 6 miles southward, respectively, of Rās Beirut, are prominent marks on this coast. 30

Nahr ed Damur (ancient *Tamyras*), which flows out about 1½ miles north-north-eastward of Rās Damur, rises in the mountainous district of Bhamdun and the higher ranges of the Lebanon, and descends through the Wadi el Kadi, a torrent in winter and during the melting of the snow, but a sluggish stream in summer. Its mouth, obstructed by sandbanks, is difficult to identify from the offing. 35

Jebel er Rihan, a part of the Lebanon range, runs parallel to the coast about 13 miles inland, and, on this mountain ridge, are the two rounded summits of Tomat Niha (page 201). 40

Tomat Niha, bearing about 096°, leads towards Sidon. The mountains between Jebel er Rihan and the coast are lower on this bearing than those northward and southward of it.

From Rās Damur to Rās Jedra, about 2½ miles southward, the coast is bordered by a sandy beach; thence to Cap Sahare, also known as Rās Rumeileh, 2½ miles farther southward, it becomes more rocky and barren, with a few scattered villages on the ridges. 45

Chart 2794.

The Nahr Oula, the entrance to which is marked by trees on either side, and also by surf, which generally breaks on the bar, enters the sea about one mile southward of Cap Sahare. 50

Anchorage may be obtained, in a depth of about 9 fathoms (16^m5), with the entrance to the Nahr Oula bearing about 100°, distant 4½ cables.

Charts 2633, 2606, 2158b, 449.

Chart 2794.

Danger.—Firefly rock (*Lat. 33° 35' N., Long. 35° 22' E.*), a rocky patch, with a least depth of 4 fathoms (7^m3) over it, lies about 6½ cables south-westward of the entrance to the Nahr Oula.

- 5 **Sidon.**—Sidon (Saida) is situated on the north-western slope of a rocky promontory, 2½ miles south-south-westward of Cap Sahare. The Château de la Mer, also known as Kalat al Bahr, an ancient ruined fortress, stands on a rock, close offshore, at the northern end of the town, to which it is connected by a bridge. The Château de St.
10 Louis, or Burj al Maisa, the old citadel, surmounted by a ruined tower, stands in the south-eastern part of the town and forms a prominent landmark.

- Ziri, an island, the southern extremity of which lies about 3 cables north-westward of the Château de la Mer, is about 20 feet (6^m1) high.
15 An islet, 18 feet (5^m5) high, lies about half a cable southward, and another islet close eastward, respectively, of the southern extremity of the island.

- A rocky spit, with a depth of 4½ fathoms (8^m2) over its northern end, extends about 2½ cables northward from the northern extremity of
20 Ziri; depths of less than 3 fathoms (5^m5), rock, extend about 2 cables southward, and 1½ cables east-north-eastward, of the southern extremity of the island.

The general depths between Ziri and the mainland eastward of it are less than 5 fathoms (9^m1).

- 25 **Light.**—A light is exhibited, at an elevation of 33 feet (10^m1), from a white metal pylon, about 13 feet (4^m0) in height, situated near the southern extremity of Ziri island (*Lat. 33° 34' N., Long. 35° 22' E.*).

- Anchorage.—Directions.**—Anchorage may be obtained in a depth of about 6 fathoms (11^m0), with the south-western extremity of the
30 Château de St. Louis in line with the centre of the Château de La Mer, bearing 186°, and the northern extremity of Ziri island between 230° and 250°.

- The usual anchorage for vessels up to a draught of 15 feet (4^m6) is in a depth of from 4 to 5 fathoms (7^m3 to 9^m1), sand, eastward of Ziri
35 island, which affords shelter from westerly and south-westerly winds.

A vessel approaching from the westward should steer for Jebel Tomat Niha (page 201) bearing 107°, which leads towards the northern approach to the anchorage. *See views on chart 2633.*

- When proceeding northward of Ziri to the anchorage, the northern
40 end of the island should be given a berth of not less than 3 cables, in order to avoid the rocky spit extending northward from it.

- Town.**—The town of Sidon is almost encircled by a substantial wall. The old citadel, already mentioned, is said to have been built by Louis IX in 1253. The ancient port, now almost completely silted
45 up, is formed by a low ridge of rocks extending north-eastward, parallel to the coast, from an ancient mole fronting the western side of the town. The population, in 1948, was 20,000.

There is a hospital in the town.

- Communications.**—Sidon is connected to the general telegraph
50 and telephone systems.

Deratisation.—*See page 15.*

Coast.—Dangers.—Caution.—Between Sidon and Tyre, 19 miles south-south-westward, the coast is bordered by rocks and shoal water, extending one mile offshore, in places. A vessel should not approach

Chart 2794.

this coast within $1\frac{1}{2}$ miles, nor within a depth of less than 16 fathoms (29^m3).

A rocky shoal, with a depth of $5\frac{1}{2}$ fathoms (10^m1) over it, the position of which is approximate, lies $5\frac{1}{2}$ miles south-south-westward of Ziri 5 island light-structure.

Rās Sarafand (Surafend) (*Lat. 33° 26' N., Long. 35° 16' E.*), 9 miles south-south-westward of Sidon, is a double-headed bluff cliff, with an islet and several rocks extending three-quarters of a mile westward of it. A narrow plain skirts the coast on both sides of the cape, the 10 hills rising from it in steep, long table flats, from 400 to 500 feet (121^m9 to 152^m4) high, on which there are several villages amidst trees.

Rās Abu Sait is situated about $3\frac{1}{2}$ miles southward of Rās Sarafand. A reef, on which there are some rocks above water, lies one mile southward of Rās Abu Sait and extends southward for about three-quarters 15 of a mile, parallel to the coast, and half a mile offshore; it is steep-to and a heavy surf breaks on it.

In 1942, a vessel, drawing 17 feet (5^m2), reported that she took the ground about 2 miles south-south-westward of Rās Sarafand, and three-quarters of a mile offshore; another vessel, drawing 24 feet (7^m3), 20 also reported taking the ground about $2\frac{3}{4}$ miles south-south-westward of Rās Sarafand, and about three-quarters of a mile offshore.

Mount Hermon or Jebel esh Sheikh, the southern peak of the anti-Lebanon range, about 30 miles eastward of Rās Sarafand, is 9,053 feet (2,759^m4) high, and its isolated cone, always snow-capped, is prominent 25 when open southward of Jebel er Rihan, the southern shoulder of the Lebanon range, about 14 miles westward of it.

The Nahr el Qasimiye (Kasimiyeh) (ancient *Leontes*) flows into the sea 3 miles southward of Rās Abu Sait, but has, during summer, a bank of sand across its mouth; it is the third largest river in Lebanon. 30 A stone bridge, with a single arch, spans the river about a mile from the coast.

Chart 2903.

Tyre.—Tyre (*Lat. 33° 16' N., Long. 35° 10' E.*), formerly an island, but now a peninsula, on which the town is situated, is connected to 35 the mainland by a sandy isthmus, and is low and flat. See view facing page 210.

Light.—A light is exhibited, at an elevation of 49 feet (14^m9), from a white tower, 20 feet (6^m1) in height, at the northern end of Tyre.

Islets and shoals.—Several low islets, surrounded by rocks and 40 shoal water extend about $6\frac{1}{2}$ cables northward from the town parallel to the coast, and thence rocky uneven bottom, with a depth of $3\frac{3}{4}$ fathoms (6^m9) near the outer end, continues $6\frac{1}{2}$ cables farther north-north-eastward.

The islets $6\frac{1}{2}$ cables from the town are just awash, and those at 45 $4\frac{1}{2}$ cables are from 3 to 5 feet (0^m9 to 1^m5) high.

Anchorage.—**Directions.**—Anchorage may be obtained by large vessels, in depths of from 9 to 10 fathoms (16^m5 to 18^m3), sand and weed, with En Nabi el Ma'shuq (Nebi el Mashuk), a remarkable white building on a rocky mound, 62 feet (18^m9) high, situated about 50 $1\frac{1}{2}$ miles east-south-eastward of the lighthouse, bearing 152°, and the guard house on Khirbet es Siddein (Ras Sidin), situated $2\frac{1}{2}$ miles north-eastward of the lighthouse, in line with a gorge of the Nahr el Qasimiye (Kasimiyeh), bearing about 082°. Anchorage may also

Chart 2903.

be obtained, by vessels of moderate draught, eastward of the islets and shoals lying northward of Tyre, in depths of from 4 to 6 fathoms (7^m3 to 11^m0), sand. Small vessels may obtain anchorage, in a depth of about 4½ fathoms (8^m2), sand, with the minaret in the town bearing about 220°, distant about 3½ cables. This is considered the most secure anchorage on the coast.

A vessel from the westward should approach with the summit of Mount Hermon bearing 078°, and on nearing the anchorage for large vessels keep the guard house on Khirbet es Siddein (*Lat.* 33° 19' N., *Long.* 35° 13' E.) in line with the gorge of the Nahr el Qasimiye and a summit of Mount Hermon, bearing about 082°, which leads about half a mile northward of the extremity of the shoals extending northward from the town.

A vessel with a draught of less than 9 feet (2^m7) may pass between the foul ground extending about half a cable northward of the lighthouse, and the southernmost rocks of the foul ground farther northward, where there is an unmarked channel about half a cable wide.

Town.—The town of Tyre, known to the Arabs as Sur, with a population, in 1948, of about 6,000, is encircled by an old wall, fast crumbling away. Confused masses of columns embedded in the solid rock, and pottery, lie strewn in every direction along the western side. On the southern side, without the walls, there are huge green and white marble columns. The remains of a mole extend some distance into the sea, with numerous granite columns along the coast. On the north-eastern side of the town are the remains of the moles which enclosed the ancient port; the port, which is now filled with sand, only affords shelter to the smallest coasting boats. Massive ruins of towers or walls rise above the drifting sand of the isthmus, which here is 20 feet (6^m1) high.

Deratisation.—See page 15.

Dangers southward of Tyre.—A line of rocks projects nearly 4 cables southward from the south-western point of Tyre peninsula, and a spit, with a depth of 2½ fathoms (5^m9) near its extremity, continues about 6 cables farther southward. Moles, built on the rocks, once formed a port eastward of them, but now only a few traces of the moles remain; the bay is therefore open to the prevalent south-westerly winds, and is never used.

A rock with a depth of 6 feet (1^m8), lies 3½ cables westward of the extremity of the spit mentioned above; it is on the northern part of a shoal, which, with depths of from 2 to 5 fathoms (3^m7 to 9^m1), extends southward half a mile, and southward of this shoal is another, with a depth of 4½ fathoms (7^m8). Rās Sarafand, or the outer northern rocks, bearing about 026°, well open north-westward of the north-western extremity of Tyre peninsula, leads westward of these shoals; at night vessels should not approach the coast into a depth of less than 18 fathoms (32^m9) until Tyre light (*Lat.* 33° 17' N., *Long.* 35° 13' E.) bears more than 028°.

Coast.—There is a low mound, named Tel Habeish, the site of ancient *Palatyrus*, about 2½ miles south-south-eastward of the south-western point of Tyre peninsula and a quarter of a mile inland; on its summit is a remarkable square building. Several streams flow into the sea hereabouts.

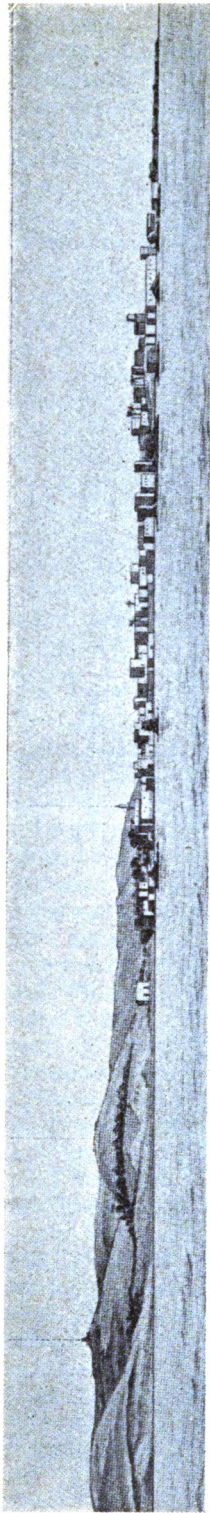
Rās el'Ain (the Fountain head), so called from numerous springs,

Charts 2606, 2158b, 449.

*Minaret,
bearing 202°, distant $\frac{1}{2}$ mile.*

Idmid.

Qal'at Shema.



Tyre from north-north-eastward.

Jebel Sannin.

Jebel Kemisa.



Rās esh Shiq'a.

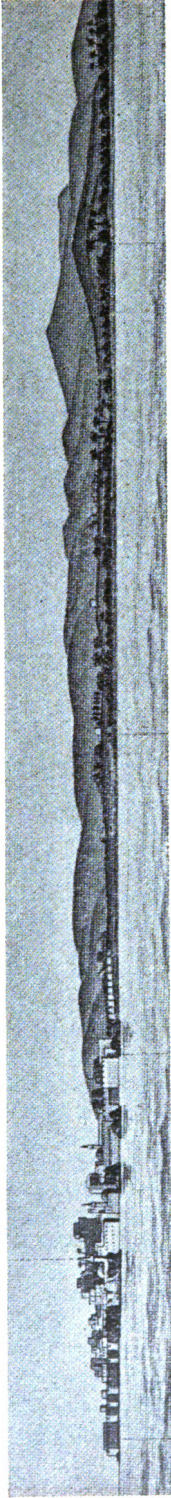
*Rās Beirut
bearing about 124°
distant 12 miles.*



Red sandhill.

View, in two parts, of the coast in the vicinity of Beirut.
(Originals dated prior to 1863.)

Citadel.



South-west bastion.

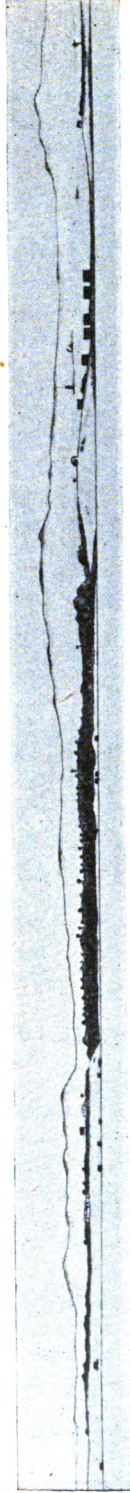
*Manara rock in line with the
east white bastion, bearing 017°.*

*Acre from the approach to the anchorage.
(Original dated prior to 1863.)*

Mount Cœur de Lion.

*Conspicuous minaret,
bearing 187°, distant 4½ miles.*

El Thamila.



*El 'Arish from northward.
(Original dated 1933.)*

Chart 2903.

lies in the plain nearly half a mile southward of Tel Habeish. Two of these springs are enclosed by stone reservoirs, and connected to Tyre by an aqueduct, 4 miles in length.

Charts 2633, 2634.

Er Rās el Abyad (ancient *Prom Album*), situated $6\frac{1}{2}$ miles southward of Tyre peninsula, is a bold, white cliff, the termination of Jebel Belat range, 2,552 feet (777^m8) high, situated $6\frac{1}{2}$ miles east-south-eastward, on which are the remains of a very ancient temple, with several columns still standing. Idmid, $1\frac{1}{2}$ miles south-eastward of the cape, is a remarkable conical table-topped mountain, 1,251 feet (381^m3) high, and Qal'at Shema (Kulat Shemma), $2\frac{1}{4}$ miles east-south-eastward of the cape, is a similar hill, 1,408 feet (429^m2) high; on these hills are villages built within the walls of ancient fortifications, which form prominent landmarks.

Chart 2634.

From Er Rās el Abyad to Rās en Naqura (ancient *Scala Tyrriorium*, the Tyrean ladder), the coast is rocky and steep. Rās en Naqura is a prominent headland with a round tower on its summit, and is the termination of Jebel Mushaqqa (Mushakka), the southern side of which descends abruptly to the Plain of Acre. The cape (*Lat.* 33° 06' N., *Long.* 35° 06' E.) is 261 feet (79^m5) high, and the land rises gradually to a remarkable round-topped hill, 1,192 feet (363^m3) high, about $1\frac{1}{2}$ miles eastward. There is an approved loading place at Rās en Naqura.

The Plain of Acre, between Jebel Mushaqqa and Mount Carmel, about 22 miles south-westward, is about 5 miles wide, studded with numerous villages, and is most fertile. The land eastward rises gradually to a mountainous range, and Jebel Jermaq its highest peak, situated $16\frac{1}{2}$ miles east-south-eastward of Rās en Naqura, is 3,963 feet (1,207^m9) high.

Near the coast, between Rās en Naqura and Acre, about $10\frac{1}{2}$ miles southward, are the Israel settlements of Nahariya and Shave Zion and the Arab village of Ez Zib, with several others among the foothills farther inland. The coast is generally rocky, but there is a sandy beach between Ez Zib and Nahariya.

Charts 2634 and 1585, Bay of Acre.

Landmarks.—Between Rās en Naqura and Acre the following objects are conspicuous and easily identified:—A yellowish concrete water tower, 146 feet (44^m5) high, surmounted by a flagstaff, standing near the coast at Nahariya, about 5 miles southward of Rās en Naqura; a white tower, about 50 feet (15^m2) high, standing near the coast at Shave Zion, about $1\frac{1}{2}$ miles south-south-westward of Nahariya water tower; an arched aqueduct, situated $2\frac{3}{4}$ miles southward of Nahariya water tower, and Bahive tomb, standing close to the coast, about $1\frac{1}{2}$ miles south-south-westward of the arched aqueduct.

Off-lying shoals.—The extensive narrow ledges of rock which front the coast, and lie roughly parallel to its general direction, are a feature of the coasts of Lebanon and Israel. These ledges, which, in places, rise abruptly, appear to be of limestone formation, over which the depth varies from 17 to 60 feet (5^m2 to 18^m3). In greater depths it is difficult to trace their extent, but it is possible that they are more or less continuous, though seldom sufficiently raised to afford any protection from the swell.

Charts 2633, 2606, 2158b, 419.

Charts 2634 and 1585, Bay of Acre.

A rocky patch, with an islet on it, lies about 2 miles north-north-westward of Nahariya water tower, and there are several shoal patches southward of it.

5 *Chart 1585, Bay of Acre.*

A reef, with a depth of 15 feet (4^m6) over it, lies about one mile westward of Nahariya (*Lat.* 33° 01' N., *Long.* 35° 05' E.), and detached patches, with depths of less than 3 fathoms (5^m5) over them, extend southward from it for a distance of about 2 miles; the sea breaks over 10 the two southernmost of these patches in a moderate swell.

Semeiriye reefs, about 4 cables southward of the southernmost of the detached patches, mentioned above, have a least depth of 17 feet (5^m2) over them.

A detached 2-fathom (3^m7) patch, the position of which is approximate, lies about 9 cables westward of Nahariya water tower.

Yussuf reef, with a least depth of 17 feet (5^m2) over it, lies between Semeiriye reefs and the coast.

The 3-fathom (5^m5) patches on Semeiriye and Yussuf reefs, and the detached patches farther northward, described above, all break in 20 heavy weather.

BAY OF ACRE.—The bay of Acre lies with its entrance between a small peninsula, on which the town of Acre stands, and Rās el Kurum (Krum), situated 6½ miles south-westward. An ancient mole, 8 feet (2^m4) high, extends about one cable eastward from the south-eastern 25 extremity of the peninsula. *See view facing page 211.*

Chart 1585, plan of Acre anchorage.

Light.—A light (*Lat.* 32° 55' N., *Long.* 35° 04' E.) is exhibited, at an elevation of 51 feet (15^m5), from a white tower, 38 feet (10^m1) in height, situated on the south-western rampart of the old fortifications 30 surrounding the town.

Landmarks.—A conspicuous minaret, 162 feet (49^m4) high, painted white with a green top stands about 3 cables north-north-eastward of the lighthouse. A prominent white bastion is situated about 2 cables east-south-eastward of the minaret. A clock tower stands about 35 1½ cables north-eastward of the lighthouse.

Dangers.—A rocky ledge, with a least depth of 12 feet (3^m7) over it, on which the sea breaks in heavy weather, extends 2½ cables southward from the shore in the vicinity of the lighthouse.

Manara rock, 22 feet (6^m7) high, lies half a cable eastward of the 40 eastern extremity of the ancient mole, mentioned above, and close southward of a patch of foul ground extending 1½ cables southward from the northern shore of the bay.

Off-lying shoals.—Vernon reefs, with a least depth of 25 feet (7^m6) over them, extend northward for one mile from a position about 45 one mile westward of the lighthouse.

Talbot reefs, with depths of from 26 to 35 feet (7^m9 to 10^m7) over them, are two rocky ledges lying southward of Vernon reefs, from which they are separated by a clear, deep channel. A rocky ledge, comparatively shoal, with isolated patches, with a least depth of 30 feet 50 (9^m1) over them, extends for a distance of 3 miles south-south-westward from Talbot reefs.

Foxhound reef, with depths of from 27 to 36 feet (8^m2 to 11^m0) over it, is a long, narrow ledge of rocky formation, extending about 1½ miles

Charts 2606, 2158b, 449.

Chart 1585, plan of Acre anchorage.

south-south-westward from a position about $1\frac{1}{2}$ miles south-south-westward of the lighthouse, and one mile offshore.

Chart 1585, Bay of Acre.

Depths.—Northward of Acre, the depths greater than 10 fathoms (18^m3) are fairly regular, but, in the vicinity of Vernon and Talbot reefs, there is more unevenness, and, unless quite certain of position, deep draught vessels should not approach the coast into a depth of less than 15 fathoms (27^m4).

Chart 1585, Acre anchorage.

Anchorage.—Good anchorage may be obtained by large vessels in depths of from 8 to 9 fathoms (14^m6 to 16^m5), sand, about one mile southward of Acre lighthouse (*Lat.* 32° 55' N., *Long.* 35° 04' E.), with the tall minaret, painted white with a green top, bearing 008°; small vessels usually anchor in a depth of about 5 fathoms (9^m1) with Manara rock bearing 017° and the lighthouse 312°. Manara rock in line with the east white bastion leads into the anchorage between Foxhound reef and the beach. During unsettled weather, or with strong sea breezes, a swell usually sets into the anchorage, and, though the holding ground is fairly good, vessels should be prepared to leave at short notice.

On the eastern side of the town, the remains of the moles which formed the ancient port are still visible, and afford shelter to small coasting vessels; this anchorage, which is very shoal, is, however, fast silting up; Manara is the name of the mole head.

Town.—The town which is known locally as Akka, and which, in 1946, had a population of 14,000, is of remarkable interest historically. The ancient fortifications and citadel are well preserved, and the town appears to be prosperous. Much has been accomplished in recent years in the way of restoration and in clearing the debris consequent on the many sieges.

Trade.—Grain, sesame seed, olive oil and fruit are the principal exports.

Supplies.—Provisions are obtainable: the bazaars, though small, are well supplied with vegetables.

Communication.—Acre is connected to the general railway and telephone systems of Israel. The main road from Beirut to Haifa passes through the outskirts of the town.

Chart 1585, Bay of Acre.

Eastern and southern shores of Bay of Acre.—The eastern and southern shores as far as Haifa are backed by low sand hills, 15 to 40 feet (4^m6 to 12^m1) high. A hill, 125 feet (38^m1) high, known as Tell Kurdani, is situated 5 miles south-south-eastward of Acre lighthouse (*Lat.* 32° 55' N., *Long.* 35° 04' E.).

The following objects are conspicuous and easily identified:—A water tower, standing in the new settlement of Qiryat Haiyam, 2 miles south-westward of Tell Kurdani, and two towers, 263 feet (80^m2) high, situated about $2\frac{1}{2}$ miles south-south-westward of the above water tower.

There are several other water towers in the Qiryat Haiyam settlement, the positions of which are indicated on the chart.

The Nahr el Muqatta (Kishon river) flows through the Plain of Esdraelon, south-eastward of Haifa and enters the sea about 2 miles south-westward of the conspicuous water tower, described above. It

Charts 2634, 2606, 2158b, 449.

Chart 1585, Bay of Acre.

is usually dry in the summer, and the only water, which is brackish, continuously reaching the sea, emanates from numerous springs on the eastern slopes of Mount Carmel, where the river is tortuous. The
 5 mouth of the river is shallow and a heavy surf usually breaks across the bar.

There are some prominent white buildings, the seaward sides of which are flood-lit at night, situated about three-quarters of a mile south-westward of the entrance to the Nahr el Muqatta.

- 10 **Land and Sea Breezes.**—In the Bay of Acre the sea breeze springs up at about 1000 and rapidly attains considerable force, being usually at its strongest between 1300 and 1400. At about 1600 it dies away rapidly and is usually calm by about 1830. In September, however, it has been observed that although it generally decreased by night-fall, it
 15 seldom died away before midnight. During the strength of the breeze sufficient sea rises to make boat work uncomfortable, though, with care, not dangerous.

At about 2200 the land breeze springs up, but blows only very gently until about 0600, when calm again ensues, and it remains calm, except
 20 for an occasional very light puff of wind, until the sea breeze sets in.

South-western shore of Bay of Acre.—The town of Haifa is situated on the south-western shore of the Bay of Acre, on the north-western slope of Mount Carmel.

- Rās el Kurum (*Lat.* 32° 50' N., *Long.* 35° 59' E.), at the north-
 25 western end of the town, is the northern extremity of the flat ground extending from the base of Mount Carmel. The ancient *Sycaminum* was probably situated on the plain southward of the cape.

- On approaching Haifa the following objects are conspicuous and easily identified :—The white building of the hospital, situated about
 30 3½ cables south-eastward of Rās el Kurum, Cape Carmel lighthouse, 528 feet (160^m9) high, standing about three-quarters of a mile south-westward of Rās el Kurum, and a water tower, situated 2¼ miles southward of Rās el Kurum.

Charts 1587, 1585, Haifa harbour.

- 35 **HAIFA.—Lights.**—The harbour is formed by two breakwaters ; the Main breakwater extends east-south-eastward for 9 cables from a point about 5 cables south-eastward of Rās el Kurum, thence curves eastward for 2½ cables ; the Lee breakwater curves northward for about 3 cables from a point 1¼ miles south-eastward of the root of the
 40 Main breakwater.

- An arm, known as East jetty, extends west-south-westward for about three-quarters of a cable from the head of the Lee breakwater, and a mole, known as West jetty, extends north-north-westward, for about 2½ cables, from a position near the root of the Lee breakwater.
 45 The basin thus formed had, in 1947, been dredged to a depth of 33 feet (10^m1).

A mole, known as Cargo jetty, extends 3 cables from the shore, parallel to West jetty and half a cable westward of it.

- Two lights are exhibited, at an elevation of 46 feet (14^m0), from white
 50 concrete towers, 31 feet (9^m4) in height, one on the head of each breakwater.

Lights are exhibited from the heads of East and West jetties, respectively, and a light is also exhibited close eastward of the root of West jetty.

Charts 2634, 2606, 2158b, 449.

Charts 1587, 1585, Haifa harbour.

Leading lights are exhibited at the western end of the harbour ; the front light from a tower, surmounted by a diamond, situated about 6 cables south-eastward of Râs el Kurum ; the rear light from a similar structure, surmounted by a circular shape, situated about one cable west-north-westward of the front light. These two lights in line bear 291°.

Chart 1585, Bay of Acre.

Seven lights, in the form of a triangle, are exhibited, from the southern of two flagstuffs, standing about 2 miles eastward of the head of the Main breakwater.

Pylons.—Two pylons, consisting of grey iron framework structures, are situated near the coast, about $4\frac{1}{2}$ miles east-north-eastward of Râs el Kurum (*Lat. 32° 50' N., Long. 34° 59' E.*). The front pylon is 33 feet (10^m1) high, and the rear one 49 feet (14^m9) high. The line joining these two pylons and Râs el Kurum, marks the limit of the port of Haifa, as indicated by a pecked line on the chart.

Two other pylons, about $1\frac{1}{2}$ cables apart, stand about one mile south-south-westward of the above-mentioned pair, and a single pylon 2 miles farther south-south-westward.

Charts 1587, 1585, Haifa harbour.

Anchorage.—**Caution.**—Vessels may obtain a safe anchorage off Haifa during the summer in any convenient depth, but they should keep clear of the reserved area, indicated by pecked lines on the chart, eastward of the Lee breakwater.

Basin.—**Pipe-line.**—A cooling water basin, formed by two breakwaters, is situated in front of the prominent white buildings standing about three-quarters of a mile south-westward of the entrance to the Nahr el Muquatta (page 213). Several lights are shown from each breakwater.

A submerged pipe-line extends about 4 cables northward from a position close westward of the root of the western breakwater. Boats should avoid the vicinity of the outlet of the pipe-line, as the water from it is ejected with considerable force.

Chart 1585, Bay of Acre.

Oiling berths.—**Caution.**—There are two berths for shipping oil about $1\frac{1}{2}$ and $1\frac{3}{4}$ miles east-north-eastward of the head of the Main breakwater, and about half a mile offshore ; the berths are at the seaward ends of pipe-lines which extend north-westward from the shore. There are two mooring buoys at each berth.

Vessels are warned not to anchor in the vicinity of the pipe-lines.

A vessel should approach the berths with caution owing to the masts of a submerged wreck extending above water, in a position about one mile west-north-westward of the head of the Main breakwater.

Directions.—See page 218.

Charts 1587, 1585, Haifa harbour.

Depths.—**Buoys.**—Off Haifa (*Lat. 32° 49' N., Long. 35° 00' E.*), the depths are regular, the bottom is sand, and the holding ground good ; a vessel should, however, ride with ample cable, especially if a heavy swell is setting in. In the western part of the anchorage vessels are inclined to lie across the swell.

In bad weather, the sea breaks in a depth of 3 fathoms (5^m5) in exposed places.

Charts 2634, 2606, 2158b, 449.

Chart 1587.

A 36-foot (11^m0) patch lies in the approach to the harbour, about three-quarters of a cable south-eastward of the head of the Main breakwater.

- 5 A shoal, with a depth of 33 feet (10^m1) over it, lies in the entrance to the harbour close north-north-westward of the head of the Lee breakwater.

A bank, with a depth of 9 feet (2^m7) over it, extends a short distance southward of the Main breakwater about 1½ cables westward of its head.

Certain areas within the harbour, indicated by pecked lines on the chart, had, in 1947, been dredged to 31, 33, and 37 feet (9^m4, 10^m1, and 11^m3).

- 15 A light-buoy, painted red, and exhibiting a *red fixed* light, is moored about half a cable east-south-eastward of the head of the Main breakwater.

A black conical buoy is moored close southward of the head of the Main breakwater, and marks the north-eastern end of the outer dredged area.

- 20 A red conical buoy is moored about a quarter of a cable northward of the head of the Lee breakwater, and marks the south-eastern edge of the outer dredged area; depths of 33 feet (10^m1) extend about three-quarters of a cable westward of the position of this buoy.

- 25 Two red conical buoys, about 1½ cables apart, are moored about half a mile westward of the head of the Lee breakwater, and mark the south-western corner of the outer dredged area.

A black conical buoy is moored about 6½ cables west-north-westward of the head of the Lee breakwater, and marks the western limit of the inner area dredged to 31 feet (9^m4).

- 30 **Berths.—Wharves.—Jetty.**—Vessels can berth inside the harbour, head southward, with their sterns secured to bollards on parts of the Main breakwater, at the wharves, or at Cargo jetty.

- The southern side of the Main breakwater being composed of boulders, the vessel's stern should not be brought within 30 feet (9^m1) of the breakwater.

The Main wharf, situated at the south-eastern end of the harbour, about one cable westward of Cargo jetty, is 1,312 feet (308^m5) long, with a depth of 28 feet (8^m5) alongside, and has a 5-ton travelling crane.

- 40 Lighter wharves East and West are continuations of Main wharf. Lighter wharf (West), also known as Intermediate wharf, is 574 feet (175^m0) long, with depths of from 15 to 28 feet (4^m6 to 8^m5) alongside, and has a 15-ton fixed derrick, a 5-ton gantry, and a 5-ton travelling crane. Lighter wharf (East) is 364 feet (110^m9) long, with a depth of 15 feet (4^m6) alongside, and has a 5-ton gantry.

Lighter wharf (Timber) adjoins Lighter wharf (West), is 2,500 feet (762^m0) long, with depths of from 3 to 6 feet (0^m9 to 1^m8) alongside.

- 50 Cargo jetty (Outer portion) is 700 feet (213^m4) long, with a depth of 28 feet (8^m5) alongside. The inner portion is 249 feet (75^m9) long, with a depth of 15 feet (4^m6) alongside. The jetty has two 3-ton travelling cranes, one 3½-ton mobile crane, and one small mobile crane, with a lifting capacity of about 12 cwt.

Pilotage.—Pilotage is compulsory for all Merchant vessels. The

Charts 2634, 2606, 2158, 449.

Chart 1587.

Port Officer will usually board H.M. Ships to indicate the berths to be taken up.

Town.—The town of Haifa (*Lat. 32° 49' N., Long. 35° 00' E.*), extends along the shore, from a point about a mile southward of the root of the Lee breakwater, as far as Rās el Kurum, and is rapidly spreading in both directions and up the slopes of Mount Carmel. The population, in 1946, was 150,000. 5

Consul.—A British Consular Officer resides at Haifa.

Port facilities.—Fresh provisions are plentiful. Water is laid on 10 to most of the wharves and jetties.

About 15,000 tons of coal are kept in stock, and there are ample supplies of fuel oil.

There are two sea-going tugs and eleven smaller ones.

Repairs to hulls and machinery can be carried out, almost any 15 type of work can be undertaken, except that requiring dry dock facilities.

Trade.—The principal exports are citrus fruits, potash, cement, soap, cereals, water melons, and skins. The chief imports are agricultural machinery, timber, coal, ironware, and building materials. 20

Deratisation.—*See* page 16.

Climatic table.—*See* page 37.

Communications.—Haifa is connected to the general railway, telegraph, and telephone systems. There is regular communication by air with Cairo, and regular steamer communication with Marseilles, 25 via Jaffa, Alexandria and Naples, and also with Beirut.

Radio station.—There is a radio station at Haifa. *See* page 15.

Chart 1585, Bay of Acre.

COAST.—Between Rās el Kurum (*Lat. 32° 50' N., Long. 34° 59' E.*) and Cape Carmel, about three-quarters of a mile south-westward, shoal 30 water, with depths of less than 3 fathoms (5^m5) extends from 2½ to 4 cables from the coast.

Tell es Samak (Semak), a remarkable hillock, 48 feet (14^m6) high, stands on the coast about three-quarters of a mile south-westward of Cape Carmel. Shoal water, with depths of less than 3 fathoms (5^m5) 35 extends three-quarters of a mile northward from this point.

A conspicuous lighthouse stands on Cape Carmel, and the monastery of St. Elias, which has a prominent red dome and belfry, is situated close south-eastward of the lighthouse.

Mount Carmel, so named from Carmel, "the park or fruitful field," 40 is a table ridge extending 12 miles south-eastward from the cape, and attains an elevation of 1,791 feet (545^m9), about 7½ miles from the cape. El Mahraqa, 1,581 feet (481^m9) high, the south-eastern peak of the ridge and 11 miles from the cape, is the supposed site of Elijah's sacrifice, and the confusion of Baal's prophets. 45

A conspicuous water tower stands nearly 2 miles south-south-eastward of Cape Carmel lighthouse.

Light.—A light is exhibited, at an elevation of 528 feet (160^m9), from a white tower on the north-western corner of a house, 67 feet (20^m4) in height, on Cape Carmel. A light, for the use of aircraft, is 50 occasionally exhibited from the same lighthouse.

Off-lying dangers.—Spartan reef, with a least depth of 17 feet (5^m2), lies 9 cables north-westward of Ras el Kurum; there is a small

Charts 2634, 2606, 2158b, 449.

Chart 1585, Bay of Acre.

rocky patch with a depth of 18 feet (5^m5), about 2 cables south-eastward of Spartan reef, and the depths in the vicinity are somewhat irregular.

- 5 Carmel reefs, on which there is a least depth of 15 feet (4^m6), are dangerous reefs lying about one mile north-westward of Tell es Samak (*Lat.* 32° 50' N., *Long.* 34° 57' E.); the ledge has depths of less than 6 fathoms (11^m0), the shoaler water being near the middle: depths in the vicinity are very irregular. There is a channel between Carmel
10 reefs and the coast, but it is inadvisable to attempt it without local knowledge. In moderate weather, the sea breaks heavily on Spartan and Carmel reefs and the shoal water northward of Tell es Samak.

- Aspect.**—The appearance of the coast is subject to considerable change due to the season of the year. In spring and early summer,
15 the freshness of the crops is most marked, but, as soon as the warm weather sets in, the country becomes parched and burnt. North-eastward of the Plain of Akka is a fine range of mountains, of which Mount Hermon is the most remarkable, and is always snow-capped. (*See* page 209.) Southward of Haifa, the plain is of less extent,
20 and the Carmel range rises abruptly at a distance of about one mile inland.

- Directions.**—Vessels approaching from southward should not proceed into a depth of less than 10 fathoms (18^m3), nor bring 'Atlit (*see* below) to bear more than 178° until past Carmel reefs; then steer
25 for the front pylon marking the harbour limit about half-way between Acre and Haifa, bearing 096°, until the tower, situated 2½ miles east-south-eastward of the head of the main breakwater, bears 129°, when steer for it on this bearing and anchor in any convenient depth.

Chart 2634.

- 30 Approaching from westward the cliff face of El Kashm (page 219) and the white face of Rās en Naqura (page 211) are conspicuous.

- Coast.**—The coast between Tell es Samak (*Lat.* 32° 49' N., *Long.* 34° 57' E.) and 'Atlit (Athlith), 7½ miles southward, consists of a sandy beach. Ledges of rocks, with depths of from 4½ to 5 fathoms (8^m2 to
35 9^m1), extend parallel to the coast, and about one mile offshore, in places.

- Tiré reefs, 3½ miles southward of Tell es Samak, and abreast the village of Tiré, lie about three-quarters of a mile offshore. There is a least depth of 3 fathoms (5^m5) at the southern end of these reefs, on
40 which the sea breaks in moderate weather.

Chart 2634, plan of Athlith.

- 'Atlit.—The old port of 'Atlit (ancient *Castellum Peregrinorum*) stands on a rocky promontory, having on its southern side a small bay, open to the north-westward, which was the ancient port. Exten-
45 sive ruins, dating from the time of the Crusaders, with Gothic and groined arches, massive foundations and vaulted sub-structures, still remaining complete, cover this area.

- The ruins of a square tower, the top of which is elevated 110 feet (33^m5), are conspicuous. There is a rocky islet about three-quarters
50 of a cable northward of this ruined tower, and two islets, 24 feet (7^m3) and 6 feet (1^m8) high, respectively, lie close northward of the southern entrance point of the bay. A rocky patch, or submerged ruins, with only a few feet of water over it, lies northward of the centre of the bay.

Charts 2634, 2606, 2158b, 449.

Chart 2634, plan of Athlith.

The present village, known as Athlith, lies about one mile south-south-eastward of the ruined tower.

Chart 2634.

The coast between 'Atlit and the village of Tantura, situated on the coast 6 miles farther southward, is rocky with small sandy indentations. There is a low, rugged ridge about half a mile inland, on which stand the villages of Sarafand and Kafr (Kefr) Lam.

On the sandy beach off Tantura village, inside some rocky islets, there is an approved loading place. Northward of the village, on a rocky mound, are the foundations of massive buildings, also rock tombs and mounds of rubbish. Boats shelter off the village, in the bay on the southern side of the promontory, which formerly constituted the ancient port (*Lat. 32° 37' N., Long. 34° 55' E.*).

Between Tantura and Caesarea, once the capital and principal seaport of ancient Palestine, $6\frac{1}{2}$ miles southward, there is a sandy beach, within which is a partially cultivated plain.

Jezirat el Haman (Hammam islet), $3\frac{1}{4}$ miles southward of Tantura, and close offshore, is black and rocky.

A conspicuous water tower stands at Zilchroon Ya'aqou, about 3 miles south-south-eastward of Tantura.

El Kashm, a flat-topped ridge, with cliffs on its western side and summit, which is ill-defined and 457 feet (139^m3) high, lies about $2\frac{1}{4}$ miles southward of the conspicuous water tower, mentioned above. There are a few scattered trees on the ridge and southward of it lies the great Plain of Sharon.

Caesarea.—The ancient port is now completely filled and nothing marks the site of the immense moles, constructed by Herod the Great and which, according to Josephus, enclosed a space equal to the Piræus of Athens. The ruins of a fortress on the southern side of the ancient port probably stand on part of one of these moles. A little to the northward are numerous granite columns in the sea, the ruins of a former landing place, and from these columns the ruins of an ancient mole, awash in places, extend $1\frac{1}{2}$ cables north-westward. A double aqueduct runs northward, the arches of which are visible above the sand drift. A fortress, with towers at regular intervals, encloses a mass of ruins. A minaret stands on the southern side of the port.

Near the middle of the small shingly bay are the remains of the Christian church, the buttresses of which are still standing, and from a distance have the appearance of pillars.

Anchorage.—Anchorage may be obtained, during the summer, about three-quarters of a mile off Caesarea, in a depth of 10 fathoms (18^m3), sand.

Coast.—The coast from Caesarea (*Lat. 32° 30' N., Long. 34° 53' E.*) to Tel Aviv, about 25 miles south-south-westward, consists of red cliffs which are broken by the mouths of Wadi Mifjur (Nahr el Mifjir), Wadi Iskanderuna (Nahr Iskenderune) and Wadi Faliq. The foreshore is generally rocky, but there are sandy beaches at the wadi mouths between Arsuf (see below) and Tel Aviv.

A conspicuous water tower stands near the coast at Nathania, about $11\frac{1}{2}$ miles south-south-westward of Caesarea.

Arsuf (ancient *Apollonia*), 19 miles south-south-westward of Caesarea, is situated on a conical hill within the cliffs, but is now only a mass of

Chart 2634.

ruins. About half a mile farther southward is Nabi el Haram, which consists of a minaret, surmounting a conspicuous white building, with a few small houses close to it.

- 5 Conspicuous water towers stand about 2 miles north-north-eastward, 2 miles south-eastward, and $1\frac{1}{2}$ miles south-south-eastward, respectively, of the minaret of Nabi el Haram.

There are loading places at Beit Yannai, about 12 miles north-north-eastward of Arsuf, and at Nabi el Haram. There is a pier at 10 Beit Yannai which had, in 1948, a depth of 7 feet (2^m1) at its head.

Coastguard stations.—There are coastguard stations at Hadera and Kefar Vitkin, situated about $3\frac{1}{2}$ miles, and 7 miles, south-south-westward, respectively, of Caesarea (*Lat.* 32° 30' N., *Long.* 34° 53' E.).

- Light.**—Auja light is exhibited, at an elevation of 65 feet (19^m8), 15 from a white square tower with black horizontal bands, situated about $5\frac{1}{2}$ miles south-south-westward of the minaret of Nabi el Haram. The light keeper's dwelling, a small white house, stands close to the lighthouse. The lighthouse is difficult to distinguish from the offing. The Auja river enters the sea close southward of the lighthouse, and a 20 rocky bar, which dries, extends across its mouth.

Chart 1591.

- Pipe-line.**—A submerged pipe-line, indicated by a pecked line on the chart, extends about $6\frac{1}{2}$ cables west-north-westward from a position on the coast about $2\frac{1}{2}$ cables northward of Auja lighthouse. Three 25 mooring buoys mark the seaward end of the pipe-line.

Landmark.—A tower, 84 feet (25^m6) high, stands half a cable north-eastward of Auja lighthouse.

- TEL AVIV.**—The port of Tel Aviv is situated at the northern end of the town, about 3 cables south-south-westward of the mouth of the 30 Auja river. It is formed by two breakwaters, known, respectively, as the Northern and Southern breakwaters, extending westward from the coast to form the entrance to a shallow harbour (*Lat.* 32° 06' N., *Long.* 34° 46' E.).

- Quays.**—South quay is 229 feet (69^m8) long, with a depth of 35 $6\frac{1}{2}$ feet (2^m0) alongside.

East quay is 492 feet (150^m0) long, with a depth of $6\frac{1}{2}$ feet (2^m1) alongside.

West quay is 295 feet (89^m9) long, with a depth of $6\frac{1}{2}$ feet (2^m0) alongside.

- 40 There are cranes on each of these quays.

Port facilities.—Small repairs can be undertaken. A small stock of coal is maintained.

Water is laid on to the quays, but there is no water-boat.

Small tugs and lighters are available.

- 45 **Town.**—Tel Aviv is the principal town and capital of the State of Israel and had, in 1946, a population of 184,000.

Consul.—A British Consular Officer resides at Tel Aviv.

- JAFFA.**—Jaffa (ancient Jappa or Japho) is the seaport of Jerusalem, from which it is 30 miles distant. The town, which had, in 1946, 50 an estimated population of 102,000, is built on and round a conical hill, about 150 feet (45^m7) high, and its white-washed houses, together with those of Tel Aviv, are prominent.

Charts 2606 2158b, 449.

Chart 1591.

On approaching Jaffa the following objects are conspicuous and easily identified:—The tower of the French convent, situated one cable north-eastward of the lighthouse (*see* below); the spire of the Latin church (*Lat.* $32^{\circ} 03' N.$, *Long.* $34^{\circ} 45' E.$), standing about $3\frac{1}{2}$ cables south-south-eastward of the lighthouse, and a water tower, situated about $5\frac{1}{2}$ cables southward of the lighthouse. 5

Light.—A light is exhibited, at an elevation of 95 feet (29^m0), from a white tower, 40 feet (12^m2) in height, situated in the north-western part of the town. 10

Off-lying danger.—A rock, with a depth of 17 feet (5^m2) over it, lies about $3\frac{1}{2}$ cables northward of the lighthouse.

Anchorage.—Anchorage may be obtained, in a depth of about 10 fathoms (18^m3), with the French convent bearing 168° , distant $1\frac{1}{4}$ miles. The best position is in a depth of 7 to 8 fathoms (12^m8 to 14^m6), sand, with the French convent bearing 116° , distant 6 cables, or between these positions. 15

Caution.—Vessels are recommended to be ready to proceed to sea immediately, when at anchor in the roadstead. The anchorage is very uncomfortable with westerly winds, which send in a heavy swell, and are accompanied by a current setting northward at from one to $1\frac{1}{2}$ knots; vessels then roll heavily, and it is advisable to proceed to sea until the swell subsides. 20

Boat harbour.—Beacons.—The harbour, which was the ancient port, situated between a sea-wall, on the north-western side of the town, and a fringe of low rocks, had, in 1937, a least depth of 6 feet (1^m8), with a least width of a quarter of a cable. The entrance is northward of the rocks, and there is also a passage between the rocks, close northward of the sea-wall, but this passage can only be used in fine weather. Leading lights, in line bearing 123° , are occasionally exhibited, and lead through in a depth of about 6 feet (1^m8). 30

Andromeda's rock, 4 feet (1^m2) high, is situated at the northern end of the above-mentioned fringe of rocks.

Two pillar beacons stand on the rocks on the western side of the main entrance to the harbour. 35

Within the harbour is the Port Office (*Lat.* $32^{\circ} 03' N.$, *Long.* $34^{\circ} 45' E.$) and landing stage, with a depth of 4 to 5 feet (1^m2 to 1^m5) alongside; wharves and quays extend about 1,000 feet (304^m8) southward. There is a small 3-ton hand crane and a 7-ton electric crane. Lighters are used for working cargo, only shallow draught craft being able to approach the quays. 40

In winter communication with the town is sometimes impossible for several consecutive days.

Trade.—The principal exports are oranges, grape fruit, wine, soap, almonds, hides, grapes, and cereals. The chief imports are textiles, timber, cement, ironware, motor cars, machinery, flour, sugar, olive oil, alcohol, tobacco, and fertilisers. 45

Port facilities.—Fresh provisions are plentiful. There is a hospital in the town.

In addition to the cranes on the quays, mentioned above, there is a 25-ton fixed crane at Tel Aviv. 50

Communications.—Jaffa is connected to the general telegraph and railway systems. There is regular steamer communication with Haifa and Beirut, and thence with European ports.

Charts 2634, 2606, 2159b, 449.

Chart 1591.

Lydda airport, from which there are regular air services to all parts of the world, lies about 10 miles east-south-eastward of Jaffa.

Chart 2634.

- 5 **PLAIN OF SHARON.**—The Plain of Sharon extends from a position about 3 miles north-eastward of Caesarea to Yibna, about 42 miles southward, and to the foot of the mountains of Samaria, from 8 to 10 miles inland. It consists of cultivated areas and pasture lands.
- 10 The mountains rise from this plain in gentle slopes, the main ridge being about 25 miles inland, and from 2,000, to 3,500 feet (609^m6 to 1,066^m8) high. The slopes are studded with numerous villages, while the principal summits are crowned with tombs, the most prominent of which are the following:—Umm el Fahm, 1,857 feet (566^m0) high, situated 13 miles eastward of Caesarea.
- 15 **Jebel Sleimiye**, 3,087 feet (940^m9) high, situated about 24 miles eastward of Arsuf (page 219).
- Jebel et Tur or Mount Gerizim** (*Lat.* 32° 12' N., *Long.* 35° 16' E.), 2,848 feet (868^m0) high, 2 miles southward of Jebel Sleimiye.
- 20 **Salman al Farisi**, 2,694 feet (821^m1) high, situated 2½ miles south-south-westward of Jebel et Tur.
- En Nabi Samweil** (ancient *Mizpeh*), 2,890 feet (880^m9) high, about 21½ miles south-south-westward of Salman al Farisi.
- 25 **Rās esh Sherifeh**, 3,281 feet (1,000^m0) high, situated 8½ miles southward of En Nabi Samweil.
- Rijm Abu Helal**, 2,976 feet (907^m0) high, 12½ miles south-south-westward of Rās esh Sherifeh, and 27 miles east-south-eastward of Ashkelon (*Lat.* 32° 40' N., *Long.* 34° 33' E.). The mountain range descends abruptly to the plain from this peak.
- 30 **COAST.**—The coast between Jaffa and Ashkelon, 25 miles south-south-westward, is, for the most part, featureless, consisting of bare undulating sandhills from 100 to 150 feet (30^m5 to 45^m7) high. A few scattered trees and bushes constitute the only vegetation, except in the vicinity of Ashkelon, where there is a considerable amount of cultivation in the form of orange and citrus groves.
- 35 **Hajar Adam**, a rock, 8 feet (2^m4) high, lies 2 miles southward of Jaffa lighthouse (*Lat.* 32° 03' N., *Long.* 34° 45' E.), and 1½ cables offshore.
- A rocky bluff, 41 feet (12^m5) high, lies 8 miles southward of Jaffa, and is the only noticeable feature on the coast. The remains of an old fortress stand on the bluff, but the masonry is covered with sand and it is not easily distinguished. Northward, on the coast, there are vague traces of old buildings, and the place is probably the site of the ancient port of *Yibna*.
- 40 The present village of Yibna is situated 4 miles south-south-eastward of the rocky bluff.
- Close northward of the rocky bluff, some rocky islets extend parallel to, and about 1½ cables offshore, and provide some protection for landing at this point in moderate weather.
- 50 The Nahr Rubin enters the sea about one mile northward of the rocky bluff. A white minaret, known as El Nabi Rubin, stands on the southern bank of the river, about 2 miles east-north-eastward of

Charts 2606, 2158b, 449.

Chart 2634.

the rocky bluff; it is visible from the north-westward, but farther southward it is generally obscured by sandhills.

About 7 miles south-south-westward of the rocky bluff, on the southern side of Wadi Abu Sweirih, there is a somewhat higher sand-
hill, 175 feet (53^m5) high, surmounted by a white tomb, known as En
Nabi Yunis. This tomb is conspicuous, except in the early morning
when its colour tends to merge into that of the background.

Minet el Qula, a large ruin, stands on the foreshore 2½ miles south-south-westward of En Nabi Yunis; with the sun behind it this ruin
shows up dark against the sand. A conspicuous water tower stands
about 2½ miles southward of Minet el Qula.

Ashkelon.—Coastguard station.—Ashkelon (ancient *Ascalon*) was built in the form of a theatre, with the two horns abutting on a line of bold cliffs, which rises, directly from the sea, to an elevation of
about 60 feet (18^m3). Little of the ancient city now remains, except for huge ramparts on the southern and south-eastern sides, which enclose a mass of ruins, fruit-tree groves, and gardens.

The position of Ashkelon may be readily identified from seaward by the amount of cultivation in its vicinity, and groves of fruit trees,
covering a considerable area and extending down to the coast, in contrast to the arid wastes to the north and south.

There is a coastguard station at Ashkelon. The small modern village, called El Jora, lies close north-eastward of the old town.

A conspicuous white tomb, known as En Nabi Hsein, stands amongst
trees on the summit of some rising ground, about three-quarters of a mile east-south-eastward of Ashkelon.

Anchorage.—There are depths of 10 fathoms (18^m3) about one mile offshore and anchorage may be obtained anywhere along the coast in this depth. The bottom is sand, changing to mud about 1½ miles
offshore, and the holding ground is good, but there is no shelter from the prevailing westerly winds.

Current.—The current off this part of the coast is normally weak and variable, but, during and after westerly gales in the spring, a northerly set is experienced up to about half a knot.

Coast.—Between Ashkelon and Tall Rafah, about 27 miles south-westward, there is rather more vegetation, in the form of scattered trees and small copses, than is found northward of Ashkelon, but, for the most part, undulating sandhills predominate.

About 15 miles south-westward of Ashkelon (*Lat.* 31° 40' N., *Long.* 34° 33' E.), a line of cliffs, about 70 feet (21^m3) high, extends for a distance of 5 miles along the coast.

Gaza.—The town of Gaza, situated about 10 miles south-south-westward of Ashkelon, and 2 miles inland, is separated from the coast by hills of drifting sand, from 100 to 150 feet (30^m5 to 45^m7) high. Two minarets, one of which is 135 feet (41^m1) high, in the town are occasionally visible from seaward between the sandhills. The chief occupation of the inhabitants is agriculture but there are also pottery, dyeing, and weaving industries. Gaza had a population, in 1946, of 40,000.

Daribat el Bahr, the port of Gaza, lies 2 miles north-westward of the town. It has a small landing pier, with a depth of 5 feet (1^m5) at its outer end. The Customs house, a black and white building with a flagstaff, stands close to the pier.

Charts 2606, 2158b, 449.

Chart 2634.

Ali el Muntar (Munstar), a hill, situated about one mile south-eastward of Gaza, is 296 feet (90^m2) high, and is surmounted by a tomb and some trees. It is flat-topped and is conspicuous from seaward, as it rises considerably higher than the surrounding foothills.

There is a wind pump at Bir Zawalan, about 1½ miles north-westward of Gaza.

Anchorage.—Vessels loading from Gaza may obtain anchorage, in a depth of 10 fathoms, one mile offshore, but the position is exposed and there is usually a heavy swell from the westward.

Communications.—Gaza is connected to the telegraph and railway system. There is a regular air service with Great Britain and India.

Trade.—The principal export of Gaza is barley, but vessels do not often call there as there is usually little available.

Loading places.—Between Gaza (*Lat. 31° 30' N., Long. 34° 28' E.*) and Tall Rafah, the following loading places off the coast are occasionally used by local vessels:—Off the mouth of Wadi Ghazza (Ghazze), off Deir el Balah, and off Khan Yunis, situated 5 miles, 7½ miles and 12½ miles, south-south-westward, respectively, from Gaza.

Coast.—Khan Yunis, already mentioned, is about 2½ miles inland and lies near the crest of a gentle slope behind the sandhills. It is visible from seaward but the houses closely resemble the sandy foreground. The village is connected to the railway system.

Dangers.—A rock, almost awash, lies 3½ cables from the coast off Tell el Qatifa, situated 10 miles south-south-westward of Gaza. A depth of 35 feet (10^m4), close within depths of 10 fathoms (18^m3) and 9 cables offshore, is situated 1½ miles south-westward of this rock. A rocky ledge, one foot (0^m3) high, lies 2 cables offshore at Tell Ridan, 1½ miles south-south-westward of Tell el Qatifa.

Coast.—The coast from Tall Rafah to El 'Arish, 24 miles south-westward, consists of almost bare sandhills, from 150 to 200 feet (45^m7 to 61^m0) high. Close inland there are numerous scattered palm trees and bushes. In clear weather the mountain ranges inland are visible behind the sandhills.

A bend in the coast, about 14 miles south-westward of Tall Rafah (*Lat. 31° 19' N., Long. 34° 13' E.*), with a few off-lying rocks, forms a small natural harbour, where there is good landing in moderate weather.

For the description of the coast westward of El 'Arish, *see* page 130.

Off-lying dangers.—A shoal, with a least depth of 5½ fathoms (10^m1) over it, lies about 1½ miles offshore, 8 miles north-eastward of the conspicuous minaret at El 'Arish.

Depths.—Between Cape Carmel and El 'Arish, a distance of about 120 miles, the depths shoal gradually from the 50-fathom (91^m4) contour towards the shore. Off Cape Carmel the 50-fathom (91^m4) contour is about 5 miles offshore and farther southward is found at gradually increasing distances from the coast, i.e., 6½ miles off Caesarea, 8 miles off Jaffa, 10 miles off Gaza, and 18 miles off El 'Arish.

Between Tall Rafah and El 'Arish the depths are less regular, 10 fathoms (18^m3) being found off El 'Arish, about 5 miles offshore.

Charts 2606, 2158b, 449.

APPENDIX I

LIST OF PORTS AVAILABLE FOR UNDER-WATER REPAIRS, with details of Largest Dry or Floating Dock or Patent Slip at each Port

NAME OF PORT AND TYPE OF DOCK, &c.	Length from bilge of caisson or mitre Post of gates at		Breadth of entrance at		† Distance { below (+) above (—) Chart datum level of	Blocks, at		Springs rise	Maximum depth over blocks		REMARKS	
	Coping head (1)*	Floor head (2)*	Coping (3)†	MHWS level (4)†		Sill (5)	Entrance		Forward (9)	Aft (10)		
							(6)					Head (7)
ALEXANDRIA : Dry Dock . . .	Feet 533.5	Feet 520.0	Feet 64.0	Feet 64.0	Feet +22	Feet +20	Feet +20	Feet 1.0	Feet —	Tons —	(12)	
PORT SAID : Floating Dock . . .	294.2	260.0	72.4	60.7	—	—	—	0.5 to 1.5	18.0	18.0		2,952
TRIPOLI (LIBYA) : Patent slip . . .	—	—	—	—	—	—	—	—	—	—		200

* In the case of Floating Docks, Patent Slips, &c., Column (1) = Extreme Length; Column (2) = Length on Blocks or Cradle.

† In the case of Floating Docks, Column (3) = Breadth at top; Column (4) = Breadth at bottom of Dock.

‡ In order to find the depths on Sill, &c., the quantities in Columns (5), (6) and (7) should be applied according to sign to the predicted or calculated height of tide as obtained from the Admiralty Tide Tables.

APPENDIX II

LIST OF PRINCIPAL PORTS, SHOWING PARTICULARS OF DEPTHS, &c.

PORT	Depths at M.L.W.S.		Rise of tide		REMARKS
	In channel of approach	In anchorage	Spgs.	Nps.	
Tripoli (Libya) ..	5½ to 9 fms. .	5½ to 16 fms.	1.4	1.1	In roadstead.
" " ..	3½ to 5 fms. .	19 to 34 feet.	1.4	1.1	Inner harbour.
Bengasi	6 fms.	3½ to 6 fms. .	1.2	0.8	Nuovo Porto.
"	7 feet	—	1.2	0.8	Vecchio Porto.
"	11 feet	—	1.2	0.8	Sebchet el-Bunta.
Mersa Matrûh ..	19 feet	23 to 48 feet. (Outer harbour)	1.0	—	Inner harbour depths 19 to 41 feet.
		19 to 37 feet	1.0	0.8	
Alexandria :—					
Marabut pass	20 feet		1.0	0.8	In 1944.
Great pass ...	34 feet		1.0	0.8	In 1949.
Boghaz pass ..	21 feet		1.0	0.8	In 1949 : Max. draught allowed :—18 feet.
Corvette pass .	19 feet		1.0	0.8	
Port Said	35 feet	8 to 10 fms. .	1.2	1.0	Outer anchorage.
Marmaris	Deep	7 to 20 fms. .	—	—	
Karaağaç liman .	Deep	10 to 25 fms. .	—	—	
Fethiye	Deep	7 to 10 fms. .	—	—	
Kastelorizo	Deep	4 to 7 fms. .	—	—	
Mersin	Deep	5 to 6 fms. .	—	—	
Limassol	Deep	7 to 12 fms. .	—	—	
Larnaca	Deep	10 to 15 fms. .	—	—	
Famagusta	Deep	3 to 17 fms. .	1.75	1.5	Outer harbour.
"	23 feet	23 feet	1.75	1.5	Inner harbour.
Iskenderon	Deep	9 fms.	—	—	26 to 32 feet alongside Deepwater jetty.
Latakia	3½ to 8 fms. .	8 to 10 fms. .	—	—	17 to 24 feet within harbour.
Ruad island	5 to 6 fms. .	5 to 6 fms. .	—	—	
Tripoli (Lebanon)	Deep	7 to 10 fms. .	1.9	1.2	
Beirut	Deep	11 to 36 fms. .	1.2	0.8	Outer anchorage.
"	8 fms.	3 to 8 fms. .	1.2	0.8	25 feet alongside nor- thern quay of central mole.
Sidon	Deep	4 to 6 fms. .	—	—	
Tyre	Deep	4 to 10 fms. .	—	—	
Acre	Deep	5 to 9 fms. .	0.7	0.3	
Haifa	6 to 10 fms. .	7½ to 10 fms. .	0.7	0.3	
Tel Aviv	1½ to 9 fms. .	7½ to 9 fms. .	0.8	0.2	
Jaffa	Deep	7 to 10 fms. .	0.8	0.2	

APPENDIX III

LIST OF SPOTS SUITABLE FOR MAGNETIC OBSERVATIONS

Place	Lat. Long.	Position
Tripoli (Libya) . . .	32° 51.7' N. 13° 11' E.	In " Parco della Runembrazza," about 2 miles due south of the fort in the centre of the city. The station is reached by passing through the city gate, Porta Bir Acara, thence passing to the left of the Forest caretaker's house to a distance of about 100 yards beyond it. The station is seen on a knoll, about a quarter of a mile ahead, and is marked by a granite column, 6 feet long, about 2 feet in diameter, and projecting about 20 inches above ground level. True bearings :—Tip of Cathedral spire 186° 41.6'; cross on dome of same building 187° 25.7'; centre of tall chimney near the city gate, Porta Bir Acara.
Misurata	32° 23' N. 15° 06' E.	Northward of the town, on the hill at the eastern end of a line of hills, about 140 yards eastward of the fort, and 90 yards eastward of the south-eastern corner of a barbed-wire fence surrounding the fort. It is marked by a one-inch hole in the top of a rough limestone post set flush with the ground. True bearings :—Flagstaff on fort 082° 52'; eastern wireless mast 335° 08'; western wireless mast 342° 24'.
Derna	32° 46' N. 22° 39' E.	On sloping ground south-eastward of the town, near the military barracks, 40 yards north-westward of the stone wall enclosing the barracks. It is marked by a hole in the top of a cement post, 6 inches square, secured in the under-lying rock, and covered by a pile of loose stones. True bearings :—Top of lighthouse 154° 39'; flagstaff on wireless station 156° 55'; northern corner of barracks 271° 34'.
Daba	31° 03' N. 28° 29' E.	About 220 yards south-south-eastward of the coastguard station, near the top of a low rocky mound which stands out prominently from the surrounding level ground. It is marked by a wooden peg in the top of a masonry pier, about 16 inches square and projecting 6 inches above the ground. True bearings :—The minaret of the mosque at the railway station 016° 51'; flagstaff at the coastguard station 153° 22'; south-western corner of the coastguard watch tower near the coast 177° 18'.
Alexandria (near) . . .	31° 16' N. 30° 00' E.	On the coast about 7 miles north-eastward of Alexandria and about 2 miles beyond Ramleh. It is marked by a cement post, which, in 1914, projected about 2 feet above the ground. True bearings :—Minaret of the mosque Sidi Beshur 019° 33'; spire on El Serai palace 038° 20'; left-hand or outer tower of the Khedive's palace at El Montaza 230° 25'; tip of the minaret of the mosque El Mandara 242° 46'.
Larnaca.	34° 54' N. 33° 38' E.	In the central part of the park owned by the municipal government, southward of the town. True bearings :—Minaret in the town 198° 20'; south-western corner of the powder magazine wall 342° 02'.
Iskenderon.	36° 35' N. 36° 11' E.	On the Aleppo road in an open field 80 yards westward of an enclosure surrounded by an ancient wall. True bearings :—Signal tower on the lighthouse 162° 39'; cross on the tower of the Roman Catholic church 203° 44'; minaret in the town 219° 11'.

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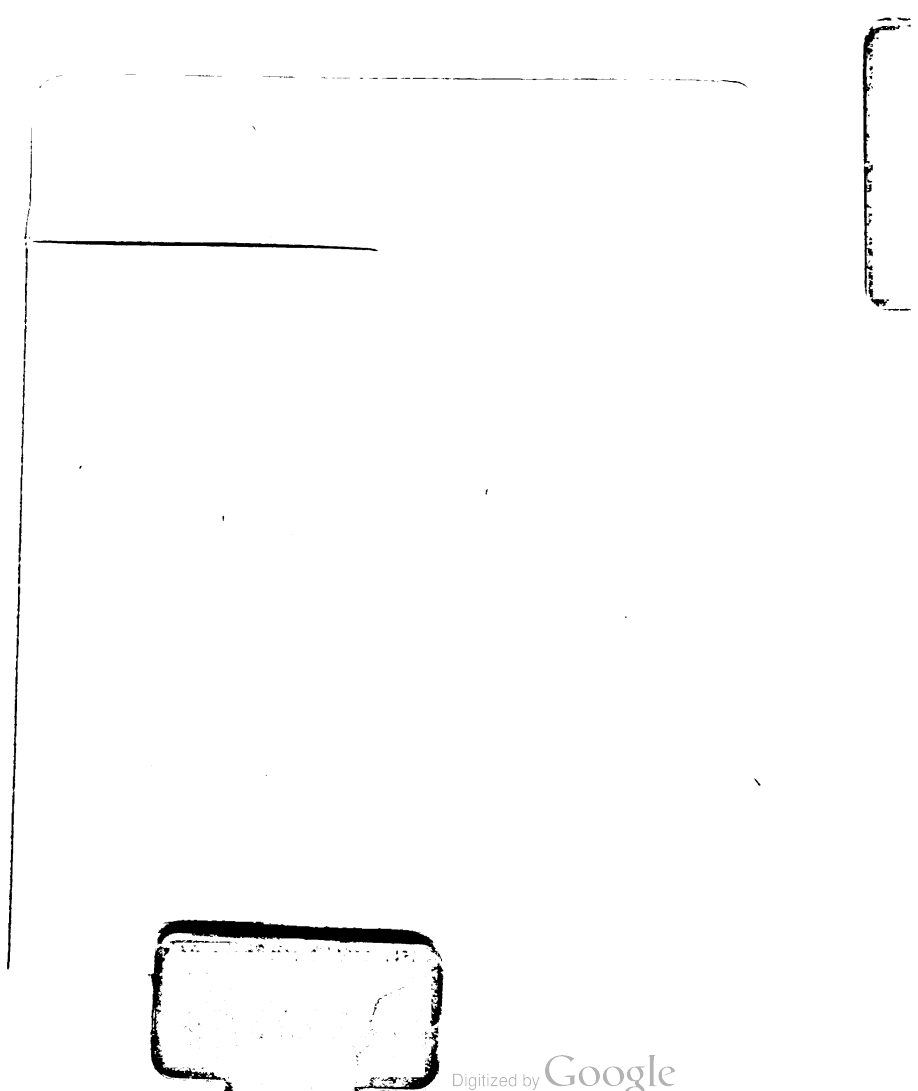
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